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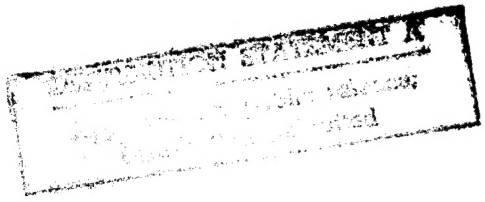

USSR Report

SCIENCE AND TECHNOLOGY POLICY

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ORGANIZATION, PLANNING AND COORDINATION

RESULTS OF EXPERIMENT AT TALLINN ELECTRIC EQUIPMENT ASSOCIATION

Tallinn SOVETSKAYA ESTONIYA in Russian 8 Feb 85 p 2

[Article by V. Miroshnichenko, general director of the Tallinskiy elektrotekhnicheskiy zavod imeni M. I. Kalinin Production Association, and N. Chelokompets, senior instructor of Tallinn Polytechnical Institute: "A Year Under the Conditions of the Experiment"]

[Text] The Tallinn Electrotechnical Plant imeni M. I. Kalinin Production Association is one of the four enterprises of the Estonian SSR, to which fell the responsible task to participate as of 1 January 1984 in the large-scale economic experiment.

The conditions of the experiment contain important potentials of the quantitative and qualitative growth of production. The year's experience of work of the association is evidence of this.

For the first time in many years the 100-percent fulfillment of the sales plan with allowance made for contractual deliveries was ensured. The plan assignments on the volume of production of the standard net output and on the planned and above-plan decrease of the production cost was completely fulfilled. The annual plan of the production of new types of products was fulfilled by 116 percent. The growth rate of labor productivity, which came for the year to 7.6 percent, is being maintained at a high level. The proper ratio between the growth rates of labor productivity and wages is being ensured. A relative saving of wages in the amount of 31,000 rubles, which in the past did not exist at all, appeared. The plan of the profit was exceeded. An additional 151,000 rubles were credited to the material incentive fund. The payments to the budget are being made in good time, there is no debt.

But, perhaps, the great thing is that the labor mood of the workers of the plant changed noticeably for the better, the responsibility of the chiefs of the shops and divisions, the foremen and the brigade leaders for the state of affairs in the sections headed by them increased.

The enterprise in the past also worked rather well, but for the first time it approached the end of the fiscal year with such a capacious package of positive indicators.

The impression might be created that the conditions of the experiment automatically predetermined the near normal conditions of the work of the enterprise. However, potentials are potentials because it is not always known how to take them up and what keys to fit to them.

At the plant they organized the thorough study of the conditions of the experiment and revised the content of economic training. The specific nature of the concrete goal: to inform extensively everyone about the new conditions--from the director to the worker, so that everyone would be filled with concern for the fate of the experiment, was taken into account. The party, trade union and Komsomol organizations put their forces into action. The workers of the economic and financial services of the association did much useful work.

The above-standard reserves of commodity stocks were reduced to a minimum. The experiment is erecting an effectively working barrier to mismanagement, reducing the profit by 3 percent for every percent of above-standard reserves for which credit has not been extended by the bank. For our enterprise 3 percent is 30,000 rubles, which are "cut off" from the material incentive fund for every million rubles of above-standard reserves. If you build up surplus reserves, you pay from your own pocket! The experiment ran like a good broom through the plant bins.

At the enterprise they understood that even the greatest enthusiasm of the collective, which is born from the trust placed in it, will be unproductive, if it is not supported by a well thought out system of the day-to-day management of production.

The introduction of a system of daily, 24-hour reports through production control communications channels was the most radical decision. In the morning report the production chief specifies the assignment, while the reports on fulfillment are used in the evening report. The entire association has been changed to a 24-hour work schedule. Every deviation from the schedule is taken into account and is analyzed by specialists, and steps are immediately taken on restoring the lost pace. People have begun to plan their own work in a completely different way. Responsibility has increased. We will not conceal that there was also discontent. But now, I dare say, no one imagines how it is possible to work differently.

Taking into account that under the conditions of the experiment the orders and marketing and the material and technical supply services and the service for making up complete sets are becoming the key ones, they made the heads of them energetic, highly skilled managers with an increased sense of responsibility: T. Gorshenina, A. Ustin and L. Kleymov. Other sections were also reinforced with personnel.

Specialists know well the problem of the economic independence of enterprises (and its reserve--economic responsibility), which, unfortunately, remains unsolved. The number of different kinds of approved and estimate indicators is enormous, the petty tutelage on the part of superior instances, which at times do not have a direct bearing on production, has still not been eliminated.

The economic experiment is a major, although quite cautious step in the direction of the solution of this ripe problem. The broadening of the rights of enterprises affected first of all the questions of planning and the structure of management. Along with the increase of the interest in the profit this tasted of an appreciable material result. For example, the unproductive expenditures for the year of work under the conditions of the experiment as compared with 1983 decreased from 560,000 rubles to 91,000 rubles.

Independence also increased in such a sensitive area as the use of the resources of the wage fund. The chiefs of the divisions and shops can make a decision on monetary increments for conscientious, resourceful staff members within the limits of up to 35 rubles. The stimulating significance of the increments will become clearer, if it is explained that the amount of the bonuses increased from 11 to 40 percent and they are credited in accordance with the salary with the increment, which frequently doubles the initial rate. At the end of the year 880 people received increments. Incidentally, increments were also used prior to the experiment. The new thing is that now they are not included in the so-called limit of allocations to management personnel. Let us note that the key divisions: orders and marketing, material and technical supply and the making up of complete sets, as well as the shops of basic and ancillary production received priority with respect to the amount of the increments for engineering and technical personnel and employees, since in many ways the end result depends precisely on their work.

The functional relation between the increased rights, responsibility and monetary reward appears in varied ways, but most clearly in the example of the fulfillment of the obligations on contracts.

The 100-percent fulfillment of contract deliveries is accompanied by the increase of the material incentive fund by 15 percent. The stimulus is large, but it is not realized by itself. Hardly anyone believed in the possibility of solving this problem, it seemed almost fantastic. For the enterprise produces a wide assortment of items of a high technical level, many are simply unique. Each of them has an operating life which differs from the others. If you add to this the "rustproof" problem of material and technical supply, it will become obvious how complicated the relations with clients and suppliers and the problems of production and planning are.

Accompanying coupons, reports on the advance of finished items and parts from the shops, route coupons for the production of parts, which are machined in several sections, and so on have been introduced in the production control service. Previously the marketing service took upon itself the concern for the timely shipment of products, now the entire collective is interested in this.

Nevertheless the experiment still contains quite a number of problems which await their solution.

The improvement of the economic mechanism is a natural process. It is very important, however, to avoid here encroachment upon the interests of the enterprises which previously also worked under strenuous conditions.

For example, during the period which preceded the experiment the association, using every effort, maintained the average annual growth rate of labor productivity at the level of 7.2 percent. And, as it has now turned out, it thereby prepared the conditions for its own "punishment": having decreased somewhat (in accordance with the plan of the ministry!) this indicator upon being included in the experiment, we have lost tens of thousands of rubles in the wage fund. The new statute envisages the increase or decrease of the base wage fund subject to the growth rate of labor productivity over a number of years which preceded the experiment. If the rate is less than it was previously, the base wage fund is reduced by the percentage difference multiplied by the planned coefficient (for the plant 0.35); if a higher rate is planned, the fund is increased accordingly.

It was conceived, at first glance, rather well. In reality it turned out that the enterprises, which worked more intensely, were the losers, while those which held back their reserves pending the changes, being guided by egotistic interests, won.

We support the suggestions, which have appeared in the press, on the need for the more thorough study of the procedure of forming the wage fund on the basis of the differentiation of the standards with allowance made for the work of every enterprise in the past.

The experiment is also setting as a goal the further stimulation of the decrease of the production cost. However, the means chosen for this proved to be at variance with the goal.

In 1984 with a saving of expenditures with respect to the production cost in the amount of 220,000 rubles, which was actually achieved by the association, only 21,000 rubles were credited to the material incentive fund. Under the conditions, which were in effect prior to the experiment, the direct deductions due to the same saving would have come to 150,000 rubles, that is, sevenfold more.

Perhaps, "the concept of distrust," in accordance with which the enterprise is capable of decreasing substantially the product cost only in two cases: either it has overstated rates of consumption of materials or the decrease of expenditures inevitably affects the quality of items, found reflection in the new conditions.

Meanwhile it is possible to seek real, and not imaginary, reserves, but the search for them, their identification and use are comparable to the effect of a spring: each subsequent compression requires the exertion of greater and greater efforts. Hence it should be a question first of all of the establishment of standards which are equal to the efforts, so that the collectives would spare no time to seek reserves, knowing in advance that their labor will be rewarded at its true worth.

The interests of the enterprises are also being partially ignored in the sphere of planning. The formulation of the 1985 plan shows that planning organs have not yet completely mastered the situation which has been created by the experiment, at least enough to be level with its requirements. Suffice

it to say that this plan with respect to cost was formulated earlier than its nature was formed. Such gaps in time are at variance with the objective requirements of the balance of the value and physical indicators and complicate the elaboration of the specific assignments for the subdivisions of the plant, which is difficult as it is. In this direction it is still necessary to go through much, and the journey does not promise to be easy.

This is not the first year that the association has experienced serious difficulties in receiving monetary assets from the enterprises which are the users of the plant products.

Thus, as of 1 October 1983 the accounts receivable came to 1.2 million rubles (approximately a third of the annual profit) and, although last year during the same period it was possible to reduce them by one-half (557,000 rubles), still the amount is large--more than 500,000 rubles.

The situation is being aggravated by the fact that mainly lagging enterprises, on which the territorial organs of the State Bank are imposing sanctions and thus are depriving them of the opportunity to obtain credit for the repayment of the debt, find themselves in the role of debtors. Externally this looks as if the bank is punishing those which work poorly. But in practice it turns out that both parties: both the recipients and the suppliers, are equally being punished. This problem is not new, but its urgency does not pass with time.

The analysis of the debtors revealed a very important detail for constructive conclusions: a large portion of them belong to the structure of the electrical equipment industry. It is also understandable--the intrasectorial division of labor has an effect. This fact makes it possible to come in with a suggestion, in accordance with which the debt to the supply enterprise is repaid from the monetary resources of the sector, in which a certain portion of the payments of the enterprises is centralized. Such a procedure will force the ministry (all-union industrial association) to evaluate in a different way the quality of management of subordinate units and will compel it to take more vigorous and effective steps on the restoration of the solvency of the economic units of its system.

The practice of management has formulated a stereotype of thinking, according to which the idea of the 100-percent fulfillment of the plan of deliveries is recognized all but utopian.

The ministries even set a maximum threshold of nonfulfillment--in the amount, say, of 5 percent. Within it there were practically no obstacles to the payment of bonuses. Later they decreased "the threshold of lack of discipline" to 2 percent, which did not change the essence of the matter. The source of such decisions lies in the capitulation to circumstances which originated from the absence of a strict functional relation, of which the measure of responsibility for the basic content of the activity of production units--the work "for others"--is the object. Planning organs agreed to and are still now agreeing to endless adjustments. With the years there developed among economic managers a psychology of behavior, which was oriented toward the possibility of achieving success outside the plant site. One does not

restore "the measure of things" while increasing responsibility only by the increase of the norms of stimulation.

People may object: why knock at an open door, for the experiment also envisages punishment in the amount of 3 percent of the amount of the material incentive fund for the nonfulfillment of deliveries by 1 percent. Yes, this is so. But is the measure of punishment comparable to the losses, which have been calculated over the entire chain and which can arise (and do arise) from short deliveries not only by 1 percent, but also by considerably less?

A item valued at 1,000 rubles, which for the supplier comes to 0.01 percent of its sales plan, was not delivered to the plant on time. The supplier will be punished. Per worker the punishment will amount to kopecks and will remain unnoticed. But what about the producer of the final product? Here everything is different. Without having received the component, the enterprise will not be able to produce, for example, an expensive unit for the continuous power supply of a nuclear electric power plant. If the named unit is included in the plan of January, the nonfulfillment of the plan will come to more than 20 percent. This, if you like, is an emergency. For the plant the upsetting of the plan will turn into enormous moral and material costs. But this is not all. The nuclear electric power plant, not having received the vitally important unit, will not go into operation in good time. The plants, which have been built and are ready for the receipt of electric power, will not be able to cut in the knife switches.

What are the losses here? It is possible to compare them with the measure of punishment of the immediate culprit?

It is significant that the economic mechanisms of a number of socialist countries provide for the consistent application of the principle of inflexibility and the complete indemnification of losses.

In Bulgaria, for example, this principle is in effect with respect to transportation organizations for all types of contracts for the transportation of freight. Vigorous steps, which prevent "the mutual granting of amnesty" in case of deliveries, have been taken in the GDR. The concealing of the economic harm done to other enterprises is regarded as economic sabotage against socialism with all the ensuing consequences.

Thus, a turn toward the establishment of a balance of positive and negative stimuli is necessary. It is too early, apparently, to pose the question of the full restitution of the harm to others. But the threat of losses from the material incentive fund by the same 15 percent of its amount in case of short deliveries, regardless of their amount, should become a step in the direction of this. Losses are no less capable than acquisitions of increasing the intensity of the field of economic interest for the 100-percent fulfillment of the plan of deliveries.

A year of work lies behind, and at the plant all the pluses and minuses are being carefully analyzed. The main emphasis is being placed on the identification of its own omissions, of which there are many more than would be liked. The technical potentials of the automated control system for

production are not being completely used, there are problems with the use of new equipment, particularly NC machine tools, the level of labor discipline does not satisfy present requirements, many units lack efficiency and purposefulness and so on.

The experiment is continuing. If we summarize the experience of the association with one phrase, it reduces to the following: not to enter into the new "content" with the old forms and methods of production management. Work on the changeover to qualitatively new means of management, which is enormous in scale and lengthy in time, lies ahead. The experiment is only the beginning of it.

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CSO: 1814/117

ORGANIZATION, PLANNING AND COORDINATION

SCIENCE CALLED UPON TO SPUR PRODUCTIVITY

Tashkent PRAVDA VOSTOKA in Russian 22 Mar 85 p 3

[Article by A. Tankhel'son under the rubric "At the Conference Table": "Speedy Introduction--Science to Serve Industry"]

[Text] Under conditions of developed socialism, the role of science in all areas of life of society grows immeasurably. The task advanced by the 26th CPSU Congress concerning the organic union of advances of the scientific and technological revolution with the advantages of a socialist economic system is growing increasingly pressing. Comrade M. S. Gorbachev, general secretary of the CPSU Central Committee, stressed the following at a special Plenum of the CPSU Central Committee in March (1985): "We must make a decisive turn in the national economy to the tracks of intensive development. We must and are compelled to advance to the leading scientific and technological places very soon, to the highest world level of productivity of public labor."

It would be inconceivable to perform these tasks well without further refinement of party management of the entire complex process of integration of science and industry. The adjunct department of science, which was established 4 years ago under the Frunzenskiy Raykom [rayon party committee] and consists of representatives of scientific research institutes, VUZ's, design organizations and enterprises, has become a good assistant to the party committee in the matter of concentrating efforts on further acceleration of scientific-technological progress at enterprises in that rayon.

There was an interesting conversation "At the Conference Table" about the performance of the adjunct department and problems it faces, and the participants in it included workers of the party's raykom, scientists and producers.

Impact of Collaboration (by Professor N. Rizayev, chief of adjunct science department of Frunzenskiy Raykom):

The department is manned by energetic and knowledgeable people, with a feeling for innovations, who are representatives of major scientific research institutions and enterprises of this rayon, competent organizers of science and leaders of industry. A comprehensive study of the performance of scientific departments in the rayon was the first step. A strict and ongoing record began to be kept on completed scientific research work with first and foremost significance to the national economy, and help began to be provided for the process of its introduction. Introduction groups were and are being formed at industrial enterprises; producers have joined with scientists at the stage of design development. This accelerates the introduction process.

As a result, while the economic impact of introducing scientific research developments constituted about 16 million rubles in the rayon in 1980, it was 41 million in 1984. The return per ruble spent on introduced innovations is 8 rubles. However, there are still many unused reserves. For example, industrial enterprises often use only innovations that do not require alteration of production. Some enterprises try not to include technical developments in their plans so that they could then make use at their own discretion of the savings gained. This is obviously wrong.

Or another example: The stronger collaboration of scientists of the Institute of the Textile and Light Industry with worker groups led to some rather promising developments. But many of them are being introduced only to one enterprise, and even then only on 4-5 lathes. One must expand the scale of introduction and producers have the first word here.

There is unjustifiable delay in introducing a number of innovations. As far back as 1978, experimental specimens of an automated flow line for drying and ginning raw cotton, which were developed by the Central Scientific Research Institute of the Cotton-Ginning Industry and Tashkent State Special Design Office for Cotton Ginning, proved to be highly efficient at the Karasuyskiy Cotton Gin Mill. Their use reduces production space, lowers energy and metal consumption of equipment, improves quality of inspection and control of the technological process. In early 1980, the flow line was approved for series production. Several were put out and they were installed at the Bektemir Experimental Cotton Mill and the one in Ayninskiy, Tajikistan. But, due to the lack of certain triggering units for the flow lines, which were to be produced by the Uzbekkhlopkomash Production Association, further introduction of the lines is being delayed.

There has also been a sad fate for a development of the Tashkent Institute of the Textile and Light Industry, "Combined pneumatic dust-collecting device." Requests for it to be produced and delivered were received from 85 industrial enterprises in the nation. Only requests from our Frunzenskiy Rayon are missing. Since the institute has only one prototype of the device available, it cannot provide all the requests for specifications. Can a team of authors be satisfied when its development, the efficiency and necessity of which is unquestioned, has still not been put into production? Incidentally, everything, from the idea to the last part, had been done by institute departments. Yet, does a VUZ department have many technical and physical capacities?

We see one way out of this difficult situation: industrial enterprises that make contracts for collaboration with VUZ's and scientific research institutes must have an item in these documents concerning assistance in developing the appropriate technical and material base.

Elements of Success (by A. Akramkhodzhayev, academician of the Uzbek Academy of Sciences, director of the Institute of Geology and Exploration of Oil and Gas Deposits):

Petroleum prospectors expect developments of us that will be instrumental in accelerating scientific and technological progress in this sector. The staff of the institute is conducting research in many directions, it develops and introduces tens of recommendations each year in the area of geology, geophysics, geochemistry, economics, engineering and technology of drilling deep and extra-deep wells.

We have started to use a better approach to planning of scientific projects with utmost consideration of industry's demands. More than 70 percent of the research done at the institute consists of work that is performed by order and at the expense of geological prospecting organizations. This provides the necessary conditions for transmittal of developments to industry.

All of the conditions needed to accelerate the introduction process were provided by means of organizing an experimental methodological team at the institute, which is essentially our experimental and production base.

Socialist competition has become a powerful ally in the matter of intensification of scientific creativity. The staff is the instigator of a movement under the slogan of "Not a single scientific development without plans for introducing it." This initiative was approved by the Frunzenskiy Raykom and has been extended to the scientific research organizations of this rayon.

Mutually Advantageous Contact (by G. Zdryumova, chief engineer of the Tashkent Textile Combine):

The contacts between the combine and the Tashkent Institute of the Textile and Light Industry are rated quite highly by production workers. Particularly in recent years when, at the initiative of the Frunzenskiy Raykom, the republic's first scientific-educational-production association (NUPO) was formed on the basis of the VUZ and plant. It functions on a voluntary basis, on the basis of creative collaboration and economic agreements between the institute and combine, and it solves well mutually advantageous problems--to improve the efficiency of production and refine the educational process.

With establishment of this association there has been appreciable activation of the work of specialized and general education departments with respect to rendering practical assistance to the combine to upgrade existing technology, introduce new equipment and improve organization of labor. The affiliates of some base departments of the institute in industry became the main structural

sections of NUPO. Through them, prominent specialists of the combine became involved in the educational process. The work of the association is based on an agreement to collaborate, which stipulates that 27 scientific research projects, in which the combine is interested, will be done. Each year, the department affiliates prepare work schedules on the basis of the agreement, which are approved by management and institute administration. Their progress is reviewed twice a year at an enlarged meeting of the association's technical council.

With the formation of NUPO, it was possible to concentrate the efforts of scientists and students on solving concrete industrial problems and bring the educational process closer to industrial conditions. In the last 3 years, the students completed 3523 course and diploma papers on topics related to the search for innovative engineering developments pertaining to elimination of some weak points. Of that number, 534 were used with success at the combine.

> It is very important not to stretch out planning work. For this reason, the basic projects for the future have already been outlined at the combine. These are a special kind of requests made by industry to the institute for the 12th Five-Year Plan.

A Request to Scientists (by R. Turebekova, warper at the Tashkent Textile Combine):

Electromagnetic counters developed by scientists of the textile institute have been installed in our shop on all of the warping machines 2 years ago. They are simple to use, improve product quality and reduce waste. What is of particular value is that the counter stops the machine when a given volume of product is made. But this innovation has a flaw, the electromagnet often falls out of the roller.

> Our wish and request to scientists and designers is to eliminate this flaw.

But There Are No Lathes.... (by R. Korabel'nikov, chief of machine and equipment department of the cotton gin industry, Tashkent Institute of the Textile and Light Industry)

Not infrequently, introduction of highly efficient apparatus is delayed. Thus, as far back as 1979, the institute developed an original construction for ginning thin-fiber cotton, which almost doubled output of a good quality of fiber and seeds.

Experimental samples of carriages to update roller gins were manufactured at several enterprises and passed trials at the Termez, Kasan No 2 and Ulyanovsk cotton mill. The new gin construction is protected by author certificates, and is patented in the United States and Great Britain; it has been awarded silver medals at the Exhibition of Achievements of the National Economy of the USSR, where it was exhibited last year.

At the present time, blueprints are ready for a new roller gin with consideration of the results of mill trials. But the problem of manufacturing experimental specimens raised by the Glavkhlopkoprom [Main Administration for the Cotton Industry] in 1984 is still unsolved.

> It is imperative to produce prototypes faster in order to succeed in assimilation and series production of the new gin. Where is it best to place the orders? We would think that it is at the Tashtekstil'mash Plant, which produces equipment for the textile and ginning industry.

Red Tape is in the Way (by Kh. Kamilova, docent at the Tashkent Institute of the Textile and Light Industry):

The Student House of Models in the department of garment design is working on the problem of designing comfortable clothing for a dry and hot climate. The work is being done in accordance with four contracts for collaboration with enterprises which, of course, helps in the speedy introduction of the main results to industry. By order from artists, the students develop models of clothing made of new fabrics and, in a number of cases, participate in drawing them. The current order from the Tashkent Textile Combine is for models of work clothes for average engineering personnel. But the target dates stipulated in the contracts are sometimes not met, usually for some insignificant reason. In order to acquire 10 m of fabric for the models, one has to spend much time waiting around in the different departments of the combine. Management and the party organization of the enterprise should help get rid of red tape.

Machine Builders are Letting Us Down (by Kh. Davydbayev, director of the Central Scientific Research Institute of the Cotton Industry):

Cotton mills process primarily higher grades of raw cotton. But the low-grade cotton is stored for a long time. After this, when it is processed there is a decrease in yield of fiber and seeds, quality worsens and waste increases.

In order to reduce losses to a minimum, as far back as 1983 the institute recommended a new technology for processing low grades of cotton as it is received. For this purpose, specialized sections must be formed in the drying-ginning shop, at initial processing stations. This has still not been done.

Another acute problem is the drying of raw cotton. The institute developed a basically new dryer, which removes 25-30 percent of the moisture after one-time use. It was approved by the interagency commission and recommended for series production. But maching builders are not in a hurry to put it out. Another dryer, the SBT intended for thin-fiber cotton varieties, has also been waiting since 1983 for its "pass" to series production.

> Retooling would occur much faster if there were no delays in setting up series production of equipment. One should also

improve the quality of instruments which are often delivered to cotton mills with major flaws. It is also high time to establish a company center for repair and maintenance of instruments and measuring systems, train qualified personnel for this purpose, to which serious attention must be given by the Ministry of Higher Education, other concerned ministries and agencies.

Work Cannot Be Done the Old-Fashioned Way (by L. Yunusov, chief of department of chemistry of polymers, Tashkent Institute of the Textile and Light Industry):

It is inconceivable to improve the efficiency of production without making optimum use of raw material resources.

We have received an agent that makes it possible to increase the yield of silk from cocoons; it has received five author certificates and two patents have been issued by Japan, India and Pakistan. Optimum variants of using the agent under industrial conditions have also been developed, regardless of the type of reeling equipment. Scientific research groups with which we have an agreement for creative collaboration were involved in this work, which was awarded the silver and bronze medals of the Exhibition of Achievements of the National Economy of the USSR. We refer to the department of colloid chemistry of Moscow State University, Institute of Molecular Biology of the USSR Academy of Sciences, Tashkent pharmaceutical and polytechnical institutes, Institute of Chemistry of the Uzbek Academy of Sciences, several orther organizations and enterprises.

Much collective work was done. The development was, as they say, offered to the industry, whose order we filled. Together with producers at the Bukhara and Urgench silk-reeling factories, we ran experimental batches through the technological process, gave instructions on preparing the agent, but then the supply of it ran out and the producers do not want to prepare it.

This cannot be called anything but sluggishness. Yet there are in industry people who are specifically responsible for introduction of new equipment and technology. This is their sector of work, and they should be answerable. One cannot work the old-fashioned way.

Both scientists and producers shared experience at the meeting around the "conference table" of PRAVDA VOSTOKA, they called attention to unsolved problems, showed the way to eliminate flaws in an important area such as introduction of scientific developments to industry. The Frunzenskiy Raykom holds such meetings regularly. They help the raykom control introduction of scientific developments and accelerate scientific and technological progress competently and knowledgeably, concentrating attention on the end results of integrating science and industry.

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ORGANIZATION, PLANNING AND COORDINATION

UKRAINIAN GOAL PROGRAMS OF SCIENTIFIC, TECHNICAL PROGRESS

Kiev PRAVDA UKRAINY in Russian 21 Feb 85 p 2

[Article (RATAU): "Goal Programs Are Being Formulated"]

[Text] Comprehensive goal programs of scientific and technical progress have become in the republic an effective tool of the accomplishment of important national economic tasks, first of all on the saving of material, fuel, energy and other types of resources. Significant experience in their implementation has been gained during the current five-year plan. With allowance made for it the ministries and departments of the republic and the Ukrainian SSR State Planning Committee, in fulfilling the recommendations of the Council for the Promotion of Scientific and Technical Progress attached to the Ukrainian CP Central Committee, have launched work on the formulation of a set of scientific and technical programs for the next five-year plan. The state of this work and measures on its acceleration were examined at the meeting of the Commission of the Presidium of the Ukrainian SSR Council of Ministers for Question of Scientific and Technical Progress.

At the meeting it was noted that one of the most important tasks on the development of a set of interconnected scientific and technical programs is the timely and high quality preparation of their drafts at the different levels of management--republic, sectorial (intersectorial) and oblast (regional). Here it is necessary to ensure the unity of the main goals, at the accomplishment of which the programs are aimed, namely: the fundamental increase of labor productivity and the efficiency of the use of manpower and energy resources, the intensification of the agroindustrial complex, the further decrease of the materials-output ratio in industry and construction, the increase of the quality of metal products, the development and improvement of the unified transportation network, the development and the acceleration of the introduction of biotechnology.

At the same time in the report of A. S. Korniyenko, chief of the Department of Science and New Equipment of the Administration of Affairs of the Ukrainian SSR Council of Ministers, and in the statements attention was directed to the fact that the work on the formulation of the drafts of scientific and technical programs still does not completely satisfy the increasing requirements. More attention should be devoted to the formulation of the Transportation and Energy Complex programs. The commission stressed the need for the considerable stepping up of the activity of the working groups on the drawing up of the programs of all levels.

In accordance with the report of Vice President of the Ukrainian SSR Academy of Sciences Academician I. I. Lukinov the commission adopted a decision which is aimed at the dissemination of the experience of the Ukrainian SSR Academy of Sciences in the establishment of engineering centers.

Deputy Chairman of the Ukrainian SSR Council of Ministers S. I. Gurenko spoke at the meeting.

Officials of the Ukrainian CP Central Committee, the Ukrainian SSR Council of Ministers and the Ukrainian SSR State Planning Committee and executives of a number of ministries and departments of the republic took part in the work of the meeting.

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ORGANIZATION, PLANNING AND COORDINATION

ECONOMICS OF ORGANIZATION OF SCIENTIFIC, TECHNICAL PROGRESS

Moscow NEDELYA in Russian 28 Jan-5 Feb 85 pp 6-7

[Interview with Corresponding Member of the USSR Academy of Science Valeriy Leonidovich Makarov, director of the All-Union Scientific Research Institute of Organization and Management of the USSR State Committee for Science and Technology, by NEDELYA correspondent Vladislav Yankulin: "Overcoming Inertia"; date and place not specified]

[Text] We often speak about the good of science, about the fact that it is necessary to nurse its shoots, about the fact that it is necessary to seek what is new and, having found it, to introduce it everywhere in our practical life. Only the achievements of science, which are materialized in machine tools and computers, medicines and machines, can increase sharply both our well-being and the productivity of our labor. "The first and immediate thing that must be done," General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet K. U. Chernenko wrote, "is to mobilize the organizational efforts and physical assets, which are necessary for the quickest reequipment of all the sectors of the national economy, for the quick production assimilation of the most advanced technologies. This is a task of key importance."

However, the inertia of the old is great and it is not that simple to overcome it. An efficient economic mechanism, which ensures the introduction of the achievements of science and technology in the national economy, is needed. Prominent scientists, large research organizations and the entire sector of economic science are working on its development.

A NEDELYA correspondent turned to Corresponding Member of the USSR Academy of Sciences V. L. Makarov, director of the All-Union Scientific Research Institute of Organization and Management of the USSR State Committee for Science and Technology, with the request to answer a number of questions.

[Question] Valeriy Leonidovich, the basic direction of the work of your institute is the economics of scientific and technical progress. Everyone visualizes a little what scientific and technical progress is. But what is understood by its economics--the economic mechanisms of the introduction of all these achievements in the national economy or the economic problems of research and design activity proper?

[Answer] By the economics of scientific and technical progress there is understood, actually, several aspects of the problem. But the most important ones of them are the ones which affect the study and creation of the economic conditions which are conducive to the introduction of new equipment in production. When something new has originated, when prototypes, which work, and work efficiently, exist, it is then that the main problems begin. The enterprises, which are assimilating new equipment, should be economically interested in this. How one is to create an economic interest of the enterprise in the production and further dissemination of new equipment and technology, especially fundamental technology, is one of the main problems of scientific and technical progress. It is a question of an economic mechanism which would stimulate the introduction of new products, new equipment, new technology.

[Question] According to the concept, life itself should stimulate all this.

[Answer] But life does not stimulate very much. Now, unfortunately, the enterprises, which produce products assimilated long ago, on equipment which has been operating a long time, are deriving a large profit, at them, as a rule, the profitability is higher. If they begin to assimilate something new, the economic indicators worsen temporarily, labor productivity and, hence, the wage and bonuses decrease. It is clear to everyone that in the future, in 3 years, say, this item will yield a large profit, yet not now--but in 3 years! But it is necessary to somehow live 3 years.

[Question] However, the problem of introduction is not new. They have been dealing with it for more than a decade. Why did the previously taken steps prove to be ineffective, will the economic experiment, which is now being conducted in several sectors of the national economy, provide anything in this respect?

[Answer] In the system of planning there is now a clear division into the plan on new equipment and the production plan. These are two separate plans which in practice are not connected with each other. It is possible to make a complete mess of one and to fulfill the other excellently. The production plan consists of assignments on the output of already assimilated products, and in it there is not indication that it is necessary to produce new products with new parameters. Everything would be different, if matters stood as follows: if you did not fulfill the plan on new equipment, as much as you would like you also cannot fulfill the production plan, since they are closely interconnected.

We are studying whether the introduction of innovations in production is speeding up as a result of the experiment which is now under way. Unfortunately, for the present no noticeable acceleration has occurred.

In this connection additional proposals, which it would be advisable to include in the conditions of the experiment, are now being prepared. One of them is that the indicator of the technical and economic level of production and the technical level of the output being produced is being introduced among the basic indicators, in accordance with which the work of the enterprise is evaluated and its activity is planned. The problem is to measure this reliably.

The methods used today for evaluating the effectiveness of scientific and technical progress, as a rule, greatly understate its merits. A fundamentally new product, which previously simply did not exist, cannot be represented in constant, as they say, comparable prices. The price of such a product differs drastically from its use value! All new electronic devices over a short period of time become inexpensive, but provide fundamentally new opportunities. Today's computer costs approximately the same as 10 years ago, but its efficiency is 1,000-fold (and even more) greater. Modern biotechnology, chemistry and instrument making are supplying a large number of such products. Modern office equipment, which has directly revolutionized all office work, is also incomparable in price with the abacus and adding machines, and how is one to calculate the value of the accountants, who in medicine alone have made it possible to increase the accuracy of a diagnosis by tens of time!

Of course, we are still far from writing a definitive formula of the indicator of the technical level. But we know many components of it. For example, it is possible to estimate the technical level of enterprises according to some scale of ranking. One rank or another is given to them subject to their level, possibilities and the confidence which they arouse in superior organizations. Moreover, an enterprise from time to time, depending on its successes, can be raised or lowered in rank. It is possible to give more rights to whoever enjoys great trust, to free him more and more from formal and informal surveillance and, in the end, to free him from all intermediate indicators. For, in essence, it is necessary to give the enterprise a mandatory plan--what the state is counting on obtaining from it--and all the assets for the fulfillment of this plan. The rest--if the enterprise and its managers are mature enough--is the affair of the enterprise itself.

It is simpler with a product--it is possible to compare it with world standards, to check it according to various indicators, the most important one of which is reliability. It is clear that the indicator of the evaluation of a product should not be a purely cost indicator--cost, as I have already said, no longer means anything. Incidentally, the indicator of the technical level of a product is necessary as a kind of protection of the interests of the consumer. Today's product is a complex item, in which many inventions, the labor of tens of workers of related industries and the achievements of many sectors of the national economy are incorporated. Therefore, a commodity requires completely new methods of presentation to the consumer. In addition to advertising, which bears first of all a information function, the mechanism of the modern market should give the buyer certain guarantees.

Today even the capitalist state under the conditions of a market economy is forced to commission special firms, which have the laboratories and testing

grounds for this, to play the role of experts. We must use all the useful qualities of the modern market mechanism within the framework of the commodity-money relations which exist in our country, while also identifying here its negative aspects. All this can supplement the system of planning and give it the necessary flexibility.

In general, today the majority of specialists are unanimous in their opinion: the indicator of the technical level can improve drastically the situation with the acceleration of scientific and technical progress. Imagine that it has become the main planning indicator. Then, in order to increase the technical level, it is necessary to do something for the introduction of innovations. And, probably, it is impossible to calmly produce what has already existed for many years.

[Question] Who will determine this indicator and see to its reliability?

[Answer] Apparently, people who would not be subordinate to the administration of enterprises and would be independent of them and of the material wealth, which the fulfillment and exceeding of the plan provide, should be included in the technical control divisions (OTK's). For these services should in the name of the state protect the interests of the consumer. For the present their interests coincide more with the interests of the producers.

[Question] But it is also possible to call "new" what is new only according to secondary attributes, which does not change radically either the properties of a product or the economic efficiency of its production. There were many indicators, but even the most apt of them--such as, for example, the Emblem of Quality--did not avoid subjectivism. Is it all the same impossible to develop a mechanism of management, in case of which the enterprise simply does not have another means than to introduce what is new?

[Answer] The point is that it is impossible to accomplish large-scale retooling and to introduce qualitatively new technologies by purely economic measures--changes of the indicators, the regulation of the economic mechanism, in short, everything that we can call the creation of a favorable economic environment. It is a question of fundamentally new technologies, which increase labor productivity by two- to three-fold, or else by 10-fold. Significant state resources are needed for their introduction, this is at times the establishment of actually new sectors or subsectors of industry.

A new sector is established always forcibly, in a centralized planned manner. But its further development and improvement take place already in the mechanism of self-regulation and self-development, and all the conditions of the improvement of the economic mechanism, which will enable the new sector to operate efficiently, while remaining on the crest of scientific and technical progress, are necessary here.

If we speak about the possibilities at the level of the enterprise, I am ready to repeat the idea of "extra-plan production," which was once voiced by me. Its essence is that enterprises would be permitted as an initiative to set up at themselves extra-plan production. Its entire volume is in excess of the

plan. The products, which have been produced in extra-plan production, can be sold at commercial prices. All this, of course, the enterprise does at its own risk, although it is possible to provide for assistance to it in the choice of the items, which the region or country needs, and in the acquisition of the necessary equipment and raw materials.

This is one of the versions. Although, it must be said, such a thing already exists in several European socialist countries. The profit, which is formed in extra-plan production, should mainly go to the enterprise. Thoroughly adjusted mechanisms of a progressive tax subject to the amount of the profit exist here, but secondary production all the same should be profitable to the enterprise.

[Question] Does this not do harm to basic production?

[Answer] This is one of the problems. However, everything lends itself to regulation by means of economic levers. It is possible, for example, to set a strict condition: it is permitted to organize such production only in case of the unconditional fulfillment of the plan. If the plan is fulfilled by 100 percent, then, perhaps, it is possible to organize extra-plan production even on the saved and additionally received resources. The state will regulate the situation: for example, by setting a more intense plan, it will check extra-plan production, but wherever it is greatly interested in its output, on the contrary, it will reduce the basic plan. Thus, two levers--the plan and the progressive tax system--already exist for extra-plan production.

[Question] But how is the manager of the enterprise to combine his functions at the two works, which in many ways are different? How are the internal contradictions to be overcome--for it is not ruled out that both the remuneration of labor and the working conditions will be different at the basic and extra-plan works?

[Answer] Of course, there are many problems here. But the directors themselves, with many of whom I spoke on this theme, are very interested in the opportunities which are being afforded here. They said that they would agree with pleasure to the opening of such a works, if--literally everyone stressed this--this extra-plan works and its products would not be included in the plan. The manager should have the freedom to make good use at this additional works of both the quantity and the range of items being produced.

Above-plan or extra-plan production, I believe, is a major and important matter. At present the sectors of group A also produce consumer goods, moreover, goods which enjoy an extensive demand and yield the corresponding profit. This is making it possible to increase the bonuses and is stimulating the creative thinking of engineers and inventors. Resourceful enterprises would immediately come back to life and would find opportunities for the use of both their reserves, which it would no longer be necessary to conceal, and its energy, which is being wasted. And, of course, the enterprise should have the opportunity to abandon and reject the output of a product, which for some reasons proved to be difficult or unprofitable for it. One director I am acquainted with said that since he is an amateur sportsman, he set up at his place the production of different ski bindings and also produces sports

training equipment. This "minor thing" has no bearing on the basic product of the plant, it makes all this from production scraps and on the reserves of capacities. But he is very discontent when they begin to demand this additional output from him as mandatory output.

[Question] The economic experiment now under way is not the first in our national economy. Where is the guarantee that it will become accessible to the entire national economy, that its results will not remain just "experimental" data?

[Answer] Of course, an experiment is always an experiment. It is also organized in order to "smooth out" new ideas, new technical approaches. But this time I am confident: the experiment should become accessible to the entire national economy. We all sense that our economy has outgrown its former clothes, that it needs new forms. As K. U. Chernenko recently wrote, "our economy is on the verge of the point at which qualitative shifts and changes in it have become, as they say, an imperative necessity." And in this experiment it is precisely possible--and this is very important--to develop newer and newer levers, stimuli and indicators, everything that in the future will become regulators of our economic mechanism.

It must be said that extensive experimentation will also continue during the next five-year plan. In individual sectors, in individual regions. Along with this intersectorial and interregional experiments are being planned. The radical revision of the economic mechanism should also be their result. Its basic principles are quite well known today to everyone: an orientation toward the end result, toward the consumer. But the implementation of these principles is very difficult, in practice everything proves to be infinitely more difficult. For example, it is well known that it is possible to obtain the greatest success--both the logic of scientific and technical progress and foreign experience testify to this--wherever narrowly specialized works have been set up. At them both the level of developments and the speed of introduction are greater, the material outlays are less. During the implementation of the program of the retooling of Leningrad industry the decision was made to unite the sections for the production of printed circuit boards, which were scattered throughout the city. And, you know, this was not a strong-willed decision. The directors did not risk relying in this product, which they need so much, upon the new enterprise, which had not yet proven itself in any way.

There can be different solutions here. It is well known, for example, that in the world small enterprises for the production of printed circuit boards, microprocessors and other modern equipment, which is not materials-consuming, have now received significant dissemination. Perhaps, we should think about this.

[Question] Under the conditions of the experiment the enterprises have to change over to conditions of operation, which are not characteristic of them--on the financial, organizational and scientific levels. They need assistance, which production organizers, economists, mathematicians and other specialists should carry out. But has not the time come for the establishment of special firms for introduction and for the organization of production?

[Answer] I believe that such a time is not far off. For the present the status of such firms has not been specified in our country. Most likely, they should be cost accounting organizations. I believe that an experiment--the establishment of such a cost accounting association--is also needed here. Such firms exist in many socialist countries. They will very likely also appear in our country.

[Question] It is clear that the economic mechanism is complex and contradictory. Regional problems come into conflict with sectorial problems, and the latter do not always accompany all-union goals. It is difficult to reduce all of them to a common denominator. But still, in your opinion, is there some practical idea, which could help to thread all these problems together and to give a practical means of their solution?

[Answer] I believe that extra-plan production, about which we have already spoken, could become such a thread. It would require giving much initiative to the managers of enterprises. This would signify a decrease of the indicators, which are sent down from above, and an increase of the rights in the disposal of the assets of the enterprise. In the end this would precisely contribute to the finding of the proper combination of the planning and market mechanisms. Perhaps, as an experiment it is initially necessary to permit only the enterprises of the first rank, which have shown themselves to be stable with respect to all the plan indicators, to set up extra-plan production.

It must be admitted that much of what is being proposed already exists in reality, but has not been legalized and therefore has assumed undesirable forms. For example, barter in means of production. Enterprises lay in expensive equipment and scarce raw materials, in order if necessary to exchange them for what they need. What vast resources are frozen due to this!

Often an enterprise produces some scarce product and shows half of it in the plan, but keeps the rest for exchange for another scarce item. Or: someone at the request of related enterprises produces items from waste products, which are also not in the plan. All this happens "semi-legally," but it is necessary to legalize these processes.

The greater emancipation of enterprises owing to extra-plan production would make it possible to solve certain problems which are important for all of us. The vast construction of dachas is now under way. But the materials for it are actually not envisaged in the state plans--these are strictly centrally allocated materials. Why not permit enterprises to sell the above-plan output at commercial prices--for there is a demand?

Even in the relations between enterprises conditions can be created, under which each of them would receive above-fund raw materials, equipment and so on. But at different prices. Within the funds there is one price, while in excess of the funds there is another. If it is profitable to the enterprise, it will purchase everything it needs at commercial prices.

[Question] An economic experiment is more complicated than a physics experiment--its results, as a rule, are ambiguous. To see, to discern what is

new, to aim the activity of scientists and designers, institutes and plants, sectors and the entire national economy in a better, optimum direction--such is the main task of economic science at the present stage.

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FACILITIES AND MANPOWER

MEDICAL ACADEMY'S GENERAL ASSEMBLY NOTES EXPANSION OF FACILITIES

MEDITSINSKAYA GAZETA in Russian 10 Apr 85, No 29 (4474), pp 1, 3

[Text] The article summarizes a report by academician N.N. Blokhin, president of the USSR Academy of Medical Sciences (AMN SSSR), at the 53d session of the of the academy's general assembly, which took place recently in Moscow. The session discussed questions of planning and organizing medical research.

Blokhin's report dealt with the research coordinating activities of the academy's presidium and results of its work during the period 1980-1984. He noted that 42 scientific councils on large-scale problems of medicine are now operating under the presidium's direction. These councils are permanent scientific and methodological bodies which study questions of forecasting, planning and coordinating scientific research in individual branches of medicine.

Blokhin also reported on new forms and directions of cooperation with other scientific organizations, the academy's participation in long-term scientific-technical programs, and growth of the academy's research facilities and international contacts. He noted that the number of scientific institutions of the academy has increased from 46 to 64 since 1980. Among these institutions are four research centers, 45 institutes, two scientific research laboratories, and 13 affiliates of center and institutes. Mention was made of a recent decision to create a new institute on the basis of the academy's Laboratory of Resuscitation. Blokhin noted a substantial expansion of the system of scientific institutions in the academy's Siberian Branch. An Institute of Respiration Physiology and Pathology has been organized in Blagoveshchensk, and institutes of clinical immunology and therapy have been created in Novosibirsk. The Vladivostok Scientific Research Institute of Epidemiology and Microbiology has been transferred to the academy's system from the RSFSR Ministry of Public Health. Affiliates of the Institute of Pharmacology and the all-Union cardiology, oncology and mental-health centers have been opened in Tomsk, and an affiliate of the All-Union Surgery Research Center in Irkutsk. Prospects exist for creating new institutes of the branch academy on the basis of these affiliates, according to Blokhin.

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FACILITIES AND MANPOWER

EVALUATION OF CURRENT STATUS OF MACHINE-BUILDING INDUSTRY IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 16 Mar 85 p 2

[Article by Akakiy Bokuchava, chief specialist of Department of Industry Georgian State Committee for Science and Technology: "Reserves for Intensification of the Economy--Removal from Production Recommended"]

> [Text] Under the years of the 11th Five-Year Plan, much work was done in this republic to accelerate scientific and technological progress in machine building and raise the technical sophistication of the output of this important sector. The Georgian State Committee for Science and Technology is also making its contribution to this cause, systematically implementing measures to assess the technical level of machines and equipment we put out.

It is expressly at the initiative of the State Committee, with the participation of the Georgian Republic Administration for the USSR State Standard, that scientific-technical commissions were formed consisting of prominent specialists from several scientific research institutions and industrial enterprises. The commissions assessed the technical level of machines and equipment that are put out, which are of utmost importance to retooling of this republic's industrial sectors. Studies were made of the level of design work, use of modern scientific-technological achievements in the designs, operating features, quality of products and materials of the units, technical level of machine-building as a whole.

As a result of investigation and analysis of materials, it was determined that of all the items produced by this republic's 25 enterprises 178 conform to or are superior to the best Soviet and foreign analogues, 34 require updating and 40 should be removed from production.

Unquestionably we have made some strides. Thus, in the period that has passed since the last evaluation, there has been a rise in technical level of some types of machines and equipment and, accordingly, there has been an increase in share of products that conform to or are superior to the best Soviet and foreign analogues. In 1983-1984, enterprises of Union ministries assimilated the manufacture of several new types of products, updated more than 10 types of machines, equipment and instruments, which increased the efficiency of production

and improved the quality of products. There was also an increase in amount of obsolete equipment that was removed from production.

In 1983-1984, some types of machines and equipment were developed, were produced in series or at the stage of assimilation of series production, and their technical features are the same or better than the best Soviet and foreign analogues. They include: the VL-15 main-line 12-axle, 2-section electric locomotive manufactured by the Elektrovozostroitel' Production Association in 1984 an adjusting [pilot] series, which is undergoing industrial trial; the KAZ-4540 motor vehicle, which has been manufactured by KAZ [Kutaisi Automobile Plant] since 1984 as the basic model of a new family of agricultural machines with higher qualities, that has no analogues in worldwide automobile building. Among other innovations there are the model 1M63 screw-cutting lathe, the Kolkhida motor boat with hydrofoil and others.

On the whole, it can be stated with certainty that some work is being done at all of this republic's enterprises to improve product quality and raise the technical sophistication of production--at many, but not all [sic].

Thus, out of 20 products that the Georgian State Committee for Science and Technology labeled as obsolete in 1982 and recommended for removal from production, only 7 items were actually removed in 1984.

At the present time, when productive and efficient technical innovations are being developed on a planned basis, we cannot be reconciled with the output of obsolete products. They should simply be removed from production promptly. Otherwise, this becomes the main cause of constant growth in share of products being produced for over 10 years. There is another side to this problem. In some cases, products put out for more than 10 years conform to or are even superior to the best foreign models in their technical features are still in demand with consumers. This is attributable to the fact that the product had been updated in the course of production, without changing the designation for the model. For example, the UPP-2 universal amphibious vehicle manufactured by the Poti Hydromechanization Plant since 1971 conforms to and, with regard to some features, is even superior to the best foreign analogues (there are no Soviet ones), such as deeper working level, range, minimal working width, etc. All this convinces us that it is not how long machines, equipment and instruments have been manufactured, but their technical level that should be a sign of obsolescence. In this regard, it is time to raise the question of revising the GOST statute on "Development and delivery of products to industry," which says nothing about the procedure for refining and updating products.

Low capacity for competition on the foreign market is a negative consequence of extending significantly the time of product manufacture and lowering the technical level of machine-building products. In spite of the increase in products of the highest grade of quality, the share of export in this republic of machinery and equipment is still low--5.3 percent of the total volume of exported products, which is half the All-Union indicator. It often happens that when a product is certified its quality conforms to GOST specifications, but the next batches are appreciably worse in quality than the adjusting series or the batch that was selected upon recertification for testing. What does

this mean? Only that product quality worsens appreciably between certifications. And this too has its reasons: at some plants periodic product trials are not made, yet according to the same GOST such checks must be made at least once a year (under laboratory conditions).

At the Batumi Electrical Engineering Plant, for example, there is no laboratory for periodic testing; moreover, there are no stands in the shops for acceptance and delivery tests.

At many plants the departments of technical control are not functioning properly. The work of departments of quality control is often formal in nature. The only exceptions in this list are referable to a few plants--Mikrodvigatel' and Elektrovozostroitel' Production Association.

What are the chief causes that are delaying improvement of technical level and removal of obsolete equipment from production? First of all, it is the slowness of retooling. For example, at many plants there is a very large number of lathes (over 30%) and less than 15% is referable to the share of forge-and-press machines. There are actually no lathes with modern methods of processing, manipulator arms and robots, flexible automated systems.

Another retarding factor is the long time spent on development and assimilation of new products, due to inadequate production capacity and supply of modern technological equipment, among other reasons. Unsatisfactory supply of new and progressive forms of materials and components on a proper technical level, the needed product assortment, flaws in the system of certifying machine-building products in quality categories also exert an influence.

As a result, the republic's State Committee for Science and Technology, together with the Georgian Gosplan and Georgian enterprises, have elaborated specific measures to raise the technical sophistication and improve the quality of machines, equipment and other stock.

For example, it was recommended that the Stankostroitel' Production Association raise certain technical and economical indicators for a number of screw-cutting machines, develop and start producing a pipe-cutting machine with stationary pipe of the Reyka (FRG) type, etc. A concrete program has also been developed for other industries. At the present time, the USSR State Committee for Science and Technology, with the participation of ministries and agencies, is developing the methodology for assessing the technical level of products and production. According to preliminary data, work on evaluating the technical level on a national scale will be done once every 5 years, which would permit more flexible transitions to new types of products when forming plans for future development of the country.

Scientific and technological commissions have done much work, elaborated specific measures, implementation of which requires the broad participation of many production departments. It is necessary, for example, to ask this republic's industrial enterprises to prepare concrete suggestions for implementation of measures to improve the quality of products, prepare work plans for new types of products, update and remove from production obsolete equipment.

One should also strengthen the role of wholesale prices in raising the technical level and quality of machine-building products, prompt removal from production of obsolete equipment. The republic's State Committee for Science and Technology, together with the Georgian Republic Administration of the USSR State Standard must make available to concerned enterprises in the republic information about the technico-economic features of the best foreign analogues, organize permanent exhibits of the republic's export products, including exhibition of specimens of merchandise proposed for export, etc. Solutions to the above-mentioned and other questions will raise the technical level of produced machines, equipment and other items, enable them to compete on the foreign market. In this regard, the industrial enterprises of Georgian SSR must take every necessary step to overcome the existing flaws in their work, direct their efforts toward solving the important problems put by the 26th CPSU Congress and special Plenum of the CPSU Central Committee, which have demanded that there be an advance to the very first scientific-technological positions within the shortest time.

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FACILITIES AND MANPOWER

ACADEMICIAN CITES UKSSR ACADEMY OF SCIENCES ACHIEVEMENTS

Kiev POD ZNAMENEM LENINIZMA in Russian No 5, Mar 85 p 61

[Article by K. Sytnik, vice president and academician of the UkSSR Academy of Sciences: "On the Forefront of Technology"]

[Text] This year, the Day of Soviet Science will be celebrated under unique circumstances: we are preparing for the upcoming CPSU 27th congress and are also completing the 11th Five-Year Plan.

Today, the role of science and scientific and engineering progress in the intensive expansion of the economy and in all of society's life is growing constantly. The CPSU, in the decisions of the 26th congress and subsequent Central Committee Plenums, has precisely defined the main lines of Soviet scientific development.

In executing the party's decisions, the scientists of the UkSSR Academy of Sciences have made a significant contribution to the development of basic research and to the introduction of its results in the country's economy. They have also contributed significantly to the solution of pressing problems dealing with the acceleration of scientific-technical progress and the more complete utilization of scientific research for the purpose of expanding production forces, improving the social relations of advanced socialism, and educating a new man.

During the years of the five-year plan, the material-technical base of the UkSSR Academy of Sciences has grown considerably stronger, and the scientific-technical levels, quality and practical significance of scientific research have been enhanced.

Research in 1,491 areas was successfully completed between 1981 and 1984. The results of 5,230 research projects have been introduced in the national economy. A general economic benefit of approximately 4 billion rubles has been gained overall from the introduction and utilization of the results of scientific research projects by the national economy. The share of this amount made by the UkSSR Academy of Sciences amounts to more than 2.2 billion rubles, i.e., 668.3 million rubles more than in the previous five-year plan.

During the years of the current five-year plan, three discoveries by the

scientists of the UkSSR Academy of Scientists have been recorded and 8,298 certificates of authorship for inventions have been awarded; this is considerably more than for the corresponding period of the 10th Five-Year Plan. Seventy-four licenses have been sold abroad; this is 33 more licenses than in the preceeding five-year plan.

For outstanding acheivements in science and technology, 4 scientists of the UkSSR Academy of Sciences became Lenin Prize laureats, 58 - USSR State Prize laureats, 192 - UkSSR State Prize laureats and 140 - USSR Council of Ministers Prize laureats.

Significant successes have been achieved in the area of basic research.

Thus, the mathematicians of our republic have worked out a number of important theoretical problems which are practically applicable.

During the years of the five-year plan, Ukrainian scientists undertook projects about which people now begin talking with the words "for the first time in the world." For example, the UkSSR Academy of Sciences' Institute of Cybernetics imeni V. M. Glushkov scored a major achievement when it worked out the mathematical principles of design of fifth-generation computers and the creation of principally new methods of modeling multi-processor computers and their software. These achievements have no counterparts in the USRR or anywhere else in the world.

The USSR State Committee of Inventions and Discoveries recorded discoveries, which have been made by scientiists from the institutes of Hydromechanics, Hydrobiology, Physiology imeni Bogomolets, and Physics and Semi-Conductors, that have become the latest word in science.

The UkSSR Academy of Sciences' Institute of Geophysics imeni S. I. Subbotin proposed for the first time in the world a simple method for determining the heat conductivity of rocks. The model of a device, which permits the measurement of heat conductivity in rocks and the degree of the earth's heat transfer with great accuracy, has been developed and introducted under field conditions.

The research efforts conducted in the basic problems of welding, the principles of physical and chemical processes in metallurgy and powder metallurgy, and the synthesis of superhard materials have resulted in the development of a number of new progressive technological processes, materials and equipment.

Particularly, basic research in the physical processes occurring in electro-beam arc welding is being successfully conducted at the Institute of Arc Welding imeni Ye. O. Paton.

This very institute has developed an all-purpose, hand-operated instrument for cutting, welding and soldering materials in outer space, as well as for putting a thin film covering on alluminum alloys; this instrument has already been successfully tested on board the orbital station, "Salut-7."

The results of research being conducted at the UkSSR Academy of Sciences' Institute of Materials Technology Problems in phase transformations and the dynamic recrystallization of other processes, occurring during the extraction of high-strength materials on the basis of high-pressure phases of carbon and boronitride, have been utilized for the purpose of creating new tool-making materials with enhanced operational characteristics.

Work continues at the UkSSR Academy of Sciences' Institute of Casting Problems on methods to reduce the metal content in items made with light alloys by spraying them with plasma during the production process.

Power engineer scientists have successfully completed a number of basic research projects on physical and technical problems of power engineering; the results have been greatly important economically and are facilitating the further development of power engineering science, the creation of highly efficient power engineering equipment and modern control mechanisms, and control and metrological support in power engineering.

Particularly, the scientists from the UkSSR Academy of Sciences' Institute of Modeling Problems in Power Engineering have completed a program of research in the analysis of the transient process in main gas line systems; they have worked out and made operational a computer program, called "Etalon," which is intended to calculate long, transient evaluations in complex gas line systems.

The UkSSR Academy of Sciences' Institute of Electrodynamics has worked out the scientific principles for constructing systems which control the temperature of the basic structural terminals of turbo-generators for the purpose of identifying the resource more acurately, for seeing acidents in a timely manner and enhancing their reliability and service life.

UkSSR Academy of Sciences' Institute of Technical Thermo Physics has developed a new construction for thermo batteries with enhanced internal surfaces for heat transfer. On the basis of these batteries, thermo electric generators, twice as powerful as well known similar types but with identical weight and overall characteristics, have been built.

Chemical scientists have achieved new and important fundamental results during the five-year plan which have practical application to the chemical and petroleum-processing industry, ferrous and non-ferrous metallurgy, machine building, medicine and agriculture.

Scientists from the Institute of Colloidal Chemistry and Hydrochemistry imeni A. V. Dumanskiy have proposed new methods for acquiring ultra-dispersed metal particles and alloys designated for the creation of metal-containing polymer materials.

Scientists from the UkSSR Academy of Sciences' Institute of Botany imeni N. G. Kholodniy have acquired data which characterize the peculiarities of the growth processes of stem plants on structural, metabolic and phytohormonal levels.

The UkSSR Academy of Sciences' Institute of Plant Physiology has worked out, on the basis of studying a number of new types of food crops, the principles for selecting plants suitable for cultivation for the purpose of directly extracting protein from the biomass.

The efforts of the republic's social scientists have been concentrated on developing the most important socioeconomic, political and ideological issues of advanced socialist society and further strenghtening the bond between scientific research and practical application. Particularly, a number of scientific memoirs, reports, recommendations and proposals has been prepared on the issues of enhancing production efficiency, improving the agro-industrial complex and expanding the legal mechanism.

Basic overall works and mongraphs on current problems of historical, philosophical and legal science, which are significantly important for improving the society of advanced socialism, have been prepared as well.

Along with the expansion of basic research on the most important problems facing the natural and social sciences, considerable attention has been focused on solving pressing scientific-technical problems and practically utilizing scientific research.

During the current five-year plan, 55 institutions of the UkSSR Academy of Sciences are participating in the implementation of 109 union and 29 republic-level sceintific-technical programs, which are dealing with 2,500 tasks. Institutions of the UkSSR Academy of Sciences are also participating in the development of 26 programs and plans of scientific research projects which are sanctioned by the USSR State Committee of Science and Technology. More than 400 projects are being accomplished in behalf of the Food Program. Finally, there are institutions of the UkSSR Academy of Sciences which are participating in the accomplishment of 23 comprehensive plans together with a number of ministries and departments.

Let us cite here those projects which are considerably important to the national economy.

The scientists and engineers of the UkSSR Academy of Sciences' Institute of Arc Welding imeni Ye. O. Platon, together with the employees of the machine building enterprises of the cities of Zhdanov and Kramatorsk, created and introduced to production a new method of welding with fixed electrodes of extremely heavy bars power engineering, metallurgical and other equipment of major single unit power. By using this method, for example, turbor-generator rotors and bearing rollers of superstrong rolling mills can be produced with a weight of over 250 tons. Such items, welded in parts, are stronger than solid items.

The scientists of this same institute, together with the producers, created and introduced new materials and technologies for the welding, heat treatment and bending of construction materials. All of this has allowed the rapid production of highly productive technical equipment for the oil and gas, chemical and metallurgy industries.

The scientists of the Platon Institute have also created a new progressive technology which permits the production of whole machine parts with electro-smelting methods of casting. Thanks to this technology, labor productivity has increased, expenditures on alloyed stells have been reduced and equipment reliability enhanced.

Complicated technical problems have to be solved through the production of electro-beam instruments. The high quality of picture tubes, being produced by the Lvov Production Association, is the result of the painstaking effort on the part of both the enterprise's employees and the scientists who worked out and introduced new progressive technological processes.

This complex approach is also a characteristic of the joint efforts on the part of scientists and specialists who developed and introduced the technology for the production of granulated magnesium and its application in various sectors of the economy, primarily in ferrous metallugy, for the purpose of smelting iron with a low sulphur content. A highly effective method of acquiring high quality metal from ore with a sulphur content was thereby discovered.

The careful study of the characteristics of liquid metal and its slag has allowed physicists to discover a number of new physical phenomena. The results of their investigations can be practically applied.

A group of scientists and specialists under the direction of academician O. A. Kremnev of the UkSSR Academy of Sciences has proposed new technology and equipment for the acquisition of mineral fertilizers in granuals of the same size. Thanks to this proposal, losses in the transport and storing of fertilizers would be reduced and the effectiveness of their utilization increased. By using this new technology, more than 2.5 million tons of mineral fertilizers are now produced annually.

The authors of a new technology for growing alfalfa and seed have made a substantial contribution in the realization of the Food Program. New, high-yield types of this valuable feed crop have started life in many places.

The volumes of mined mineral resources increase every year because of open-pit mining, especially the mining of iron ore. In working deep deposit levels, traditional methods for the mining and transport of the mountains' mass are not applicable. Scientists and specialists have proposed a new cyclical-line technology for the purpose of carrying out mining work in the iron ore quarries of the Krivbass region. Thanks to this technology, the labor productivity of the miners has increased by 42 percent and expenditures on the ore's transport have been reduced. Approximately 30 million tons of ore are now mined yearly with this new method which allows a savings of more than 15 million rubles.

The Academy of Sciences of the UkSSR Academy of Sciences focuses a great deal of attention on the projects directed towards the fulfillment of the Food, Power Engineering and Land Reclamation programs. The CPSU Central Committee approved in 1983 an experiment of the UkSSR Academy of Sciences to increase

its efforts in the relaization of the Food Program. The Central Committee of the Ukrainian Communist Party approved in 1984 our academy's experiment to set up engineering centers as a new, highly effective form of contact between science and production.

In upcoming years, the efforts of the UkSSR Academy of Sciences will be directed towards working out pressing basic problems in the natural, technical and social sciences and increasing the academy's role in the acceleration of scientific-technical progress.

Primary attention will be focused on: problems of great economic importance, including the development of mathematical models and scientifically based mathematical research projects in physical processes; the expansion of efforts in the structure of large computers and peripheral instruments, control systems for complicated economic complexes with flexible production systems; research efforts into the characteristics of materials under extreme conditions and the creation of new and advanced materials with assigned properties; the creation of progressive waste-free and low-waste technologies for the mining of mineral resources; the improvement of facilities and methods to acquire, process and utilize energy and the creation of energy and resouce economizing technologies; research into the economic problems associated with the enhancement of production efficiency and the acceleration of scientific-technical progress.

Soviet scientists are sparing no efforts to successfully accomplish the magnificent tasks assigned to them by the party for the purpose of building communism.

12247
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AUTOMATION AND INFORMATION POLICY

COORDINATED APPROACH TO USE OF AUTOMATION AND ROBOTICS

Moscow IZVESTIYA in Russian 2 Mar 85 p 2

[Article by A. Kamenev, deputy chairman of USSR State Committee for Science and Technology: "The Connecting Link--Means of Optimum Combination of Territorial and Sector Interests. Intensive Development of the Economy"]

[Text] The idea that I should like to start with is simple and has been verified many times by experience: automation does not yield the proper effect if it is introduced disparately. Robots are of little use if the people near them are compelled to work the old way. It would not be of greater use if one tries to hook robots up with lathes that should have been replaced with new, modern ones long ago. It also happens that at one plant a high-powered computer is consistently used at less than its capacity, while at another neighboring plant there are hundreds of workers making calculations "manually," using abacuses and adding machines. How about cooperating and using the electronic equipment collectively? But this does not happen, for the plants are under the jurisdiction of different agencies.

At present there are quite a few such examples related to use of new equipment in the national economy, mainly electronics and robotics. They can be termed as growing pains. However, they must be treated. And here, questions move to the fore that deal with balanced solutions to different parts of problems of integrated automation. How, for example, should one not only develop new, modern equipment, but use it efficiently? Where should it be placed, who is to service it? How can the same departmental barrier be overcome? Finally, how can one properly combine the interests and capabilities of sectors and a region?

Life is putting these questions. It too is suggesting the means of answering them. One of them, we believe, merits first and foremost attention. We are referring to territorial programs for intensification of production on the basis of integrated automation, introduction of robotics and flexible production systems. IZVESTIYA readers have learned about two such programs, in Moscow and Leningrad. Both programs have been approved and are in operation. The ultimate effect from using them will be obtained by the end of the next, 12th Five-Year Plan. But even now, there is much of general interest in the experience gained by the people in Leningrad and Moscow. And this is not by chance.

How did these programs start? At first, some time ago, studies were made of plans for development of enterprises in both cities, within the limits of All-Union programs, by the sectors in the Moscow gorkom and Leningrad obkom of the party and Soviet agencies. They provided for extensive retooling, remodeling and introduction of modern technology, which promised a gain in rate of development and quality of products. True, these programs bore the seal of a departmental approach. In planning introduction of new technology at "their own" enterprises, the management of the sectors sometimes gave little thought to the level of production and working conditions of their neighbors. This is not a question in the case of a so-called "vertical-sectorial" approach, but for a city, a region, for common interests the difference in technological levels of neighboring and allied enterprise it is a question, and a rather sizable one.

At the same time, these programs could not take into consideration fully enough the vast potential of both regions with their large scientific resources, powerful production, experimental and educational base. These opportunities made it possible to raise and answer questions of integrated automation, robotics, development of flexible production systems and assimilation of other progressive technology on a broader scale and more comprehensively than with a strictly sectorial, departmental approach, as well as to obtain a greater and faster return.

Life is persistently teaching us that one cannot separate scientific-technological policies from conditions under which they are implemented. This narrows its perspective, diminishes return and retards technological progress.

In other words, the "vertical approach" left untouched some significant reserves of regions, the "horizontal" aspects. How are they to be used?

Preparation of the Moscow program was preceded by much work on the part of scientists and specialists of Mosgorplan [Moscow City Plan]. It involved comprehensive investigation of conditions at enterprises in the capital, their needs with respect to retooling, capacities and resources. While in some plants, mainly those that build machines, there had already been some experience with introduction of robots and flexible complexes, there were quite a few other plants and factories in the light, food, local and building industries that were only making their first steps. To help them expedite reconstruction, the program includes extensive cooperation between enterprises, institutes and associations, regardless of the sector to which they belong. The key element is not to request additional funds for reconstruction, but to properly dispose of those allocated, in an economic manner.

Implementation of the Moscow program will make it possible to gain experience in large-scale consolidation of scientific-technical and production potential of the capital city and, first of all, of the machine-building complex in the matter of switching the economy to the intensive route of development. The tasks spelled out in the program require development of 9 fully automated plants, 12 shops, 900 sections and lines with use of over 10,600 industrial robots, manipulators and transfer arms before the end of the 12th Five-Year Plan. These measures alone will release many thousands of workers presently engaged in heavy physical labor.

Or let us discuss the Leningrad program, Intensification-90. As in the Moscow version, scientists from the Leningrad Research Center of the USSR Academy of Sciences, specialists from 336 enterprises in the city and 99 sectors were called upon to analyze the situation and prepare suggestions and additions to the sectors' "vertical" programs.

Much work was done by the people of Leningrad themselves in the ministries to redistribute the initially allocated resources in order to assure a balance between scientific-technological and production problems and means of solving them at enterprises of Leningrad and the oblast. The Leningrad city and oblast councils of people's deputies and their commissions, particularly, Lenplan, became actively involved in this work. The major task of preparation required repeated revision of items in Intensification-90 by the USSR State Committee for Science and Technology and USSR Gosplan. As a result, a genuinely integrated special-purpose counterprogram was conceived as a supplement rather than counterbalance to the sectorial plan for retooling of enterprises. As we know, the Politburo of the CPSU Central Committee approved this program.

Refinement of guidelines for preparing national, sectorial and territorial programs and harmonious combinations thereof as preplan documents makes it possible to take into comprehensive consideration the achievements of scientific and technological progress in the actual plans of economic and social development on all levels. Of course, this is the first attempt and there is still much that it does not cover so as to combine in all ways the mutual interests of sectors and the region.

We can recall an important idea, which did not gain development in its times, of establishing specialized intersector procurement industries in major industrial cities, including centralized casting, which would be charged with preparation of castings for enterprises in the region. It was believed that this would assure a low cost, high output of cast items, that the need for them would be met in full and that there would be fewer two-way transport of freight across the entire country.

The idea appeared to be correct, but for one thing: the scientific and technological capacities at that time did not permit efficient organization of production in single and small batches of castings within the limits of central casting shops, for which it was advantageous to supply products in large batches, rather than small ones, which meant retooling each time, which meant losses! The present technological level and, in particular, the feasibility of flexible installations with rapid change from one type of product to another, enables us to return to that idea. We are referring not only to central casting, but specialized regional enterprises manufacturing parts and goods used in general machine-building.

A logical question arises as to management of the work to prepare and implement the programs. As stated before, it was assumed by local party and soviet bodies, supported by the scientific-technological community. Experience shows that there are enough such resources to implement a concrete, integrated scientific approach. Will new forms be needed? There are no ready answers to this and other questions as yet. And this is understandable, for they are

worked out in the course of fulfilling programs which have become, among other things, a means of research, selection of both new and tested answers. The main criterion in this selection is economic expediency.

The turn that has begun has given new content to the work of soviets, their commissions and groups of deputies. They now have a stronger influence on the rate of scientific and technological progress, as well as management of the economy. A dual thrust, so to speak, has emerged in satisfying local and sector interests, and national ones as a whole. There has been strengthening of the principle of democratic centralism in management of the national economic complex.

We should like to remind readers of the great work done in this direction in the Ukrainian SSR, where integrated programs to solve pressing problems of improving product quality (for example the system in Lvov), development of scientific production complexes aimed at solving major national economic problems have long since been developed and implemented with purpose. At the present time, an integrated scientific-technological program is being developed there to increase use of the manpower resources, called Trud. The State Committee for Science and Technology and the USSR Gosplan have prepared methodological instructions on development of national, sector, republic-level and regional special-purpose programs. At the present time, the councils of ministers of Union republics and administration of several oblasts have displayed interest in them.

In an article entitled "On the Level of Requirements of Developed Socialism," Comrade K. U. Chernenko stressed that the first and obvious thing that must be done is to mobilize organizational efforts and physical resources needed for speedy retooling of all sectors of the national economy, for rapid industrial assimilation of the most progressive technologies. This task is of key importance.

The trends described above are in this channel. The channel of a decisive change in Soviet economy toward intensive methods of management.

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AUTOMATION AND INFORMATION POLICY

NEED TO EXTEND THE ECONOMIC EXPERIMENT INTO THE R&D SECTOR

NTR: PROBLEMY I RESHENIYA in Russian 19 Feb 85, No 4 pp 1-2

[Text] The author discusses possibilities and potential benefits of extending the economic experiment that has been under way for one year at enterprises of the Ministry of the Electrical Equipment Industry into the industry's R&D sector. He observes:

"Methods of management of science and technology that have been worked out in past years still are not having sufficient impact on research institutes, design bureaus and enterprises; these organizations are oriented more toward maintaining the technical level that has been achieved, rather than pushing it higher. The main factor that is holding back optimally higher rates of technological advancement is the imperfection of existing methods of management, which are not linked with the economic system of industrial enterprises. Specifically, the share of output in the highest quality category is growing slowly because in the conditions of the experiment, this indicator has ceased to be a fund-creating one: its percentage now does not have a direct effect on the size of enterprises' economic incentives funds."

In view of this, the author says it is important now to extend the principles of the economic experiment into the R&D sector, and to strengthen the connection of management of production and R&D with ultimate economic results, orienting enterprises more and more toward production of goods that are only in the highest quality category. Speaking of economic mechanisms that help to accomplish this, the author points out that prices still are not being used as an effective mechanism. Under the present system, surcharges on wholesale prices for goods in the highest quality category are not large (5-6 percent) and are short-term (not more than three years), which the author says does not drive the developer to maximum use of the latest technological advances, or the manufacturer to rapid introductionof new technology. On the other hand, the author says the system of discounts on prices of goods that are not in the highest quality category must be made more austere, creating a disincentive for keeping them in production.

The author also addresses the question of personal incentives for developers of technology. He recommends extending the experiment of a number of Leningrad enterprises in improving the system of salaries and bonuses for designers and technologists.

When the "Elektrosila" association went over to automated designing of sophisticated electrical machinery, he notes, performance evaluations showed that 200 workers did not meet the requirements of their job categories, and they were reassigned. This made it possible to raise the salaries of a large number of designers by more than 30 percent, which had a good effect on results of design work. The author says that similar conditions should be applied to all categories of workers of research institutes, design bureaus and production associations, as well as the ministry's staff.

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AUTOMATION AND INFORMATION POLICY

PLAGIARISM, COPYRIGHT PROTECTION

Moscow MEDITSINSKAYA GAZETA in Russian 11 Jan 85 p 3

[Article by A. A. Lopatenok, docent of the Military Medical Academy imeni S. M. Kirov: "Plagiarism. What Does This Mean?"]

[Text] In recent years the question of the intolerance among Soviet scientists of such a disgraceful phenomenon as plagiarism has been repeatedly raised. Letters with reports of specific cases of plagiarism are also frequent in the editorial mail of MEDITSINSKAYA GAZETA. Their authors, as a rule, are indignant concerning the impunity of plagiarism and suggest various steps, up to the creation of a special organ for the combating of this truly intolerable evil.

As practical experience shows, not only the authors themselves, but also the directors of scientific institutions know inadequately the questions connected with the protection of copyrights. Therefore the editorial office turned to a specialist, A. A. Lopatenok, docent of the Military Medical Academy imeni S. M. Kirov, with the request to tell how the protection of copyrights is being carried out in our country.

By plagiarism (from the Latin word plagio--I steal) there is understood the reproduction under one's own name of the content of someone else's work as a whole or, and this happens significantly more often, the borrowing from someone else's work of a text or ideas without an indication of the name of the real author and the source of borrowing. Here in conformity with the law it is not of essential importance, by what motives the stealer was guided: whether he was attempting to obtain material gains or only wanted to create a favorable opinion of himself.

It should be noted that the term "plagiarism" is not used in Soviet law, while the article of the Criminal Code, in which the protection of the personal nonproperty rights of authors is envisaged, is called "the infringement of authors' and inventors' rights."

Soviet legislation on the protection of copyrights contains a number of legal norms, which make it possible to combat successfully plagiarism and other

infringements of personal copyrights. Thus, in the prevailing "Statute on the Procedure of the Awarding of Academic Degrees and the Conferment of Academic Titles" it is indicated that in case of the discovery of plagiarism in dissertation works a petition can be submitted for the deprivation of the guilty persons of the academic degrees and tiles, which have been erroneously awarded to them. It is well known that this measure is used quite extensively in the practice of the USSR Higher Certification Commission.

Soviet criminal and civil legislation contains instructions on personal liability for the illegal use of someone else's work. But due to the inadequate legal knowledge of the people, who are engaged in scientific literary activity, some legal norms, which regulate the rights and duties of authors, remain unknown and therefore cannot have their own preventive effect.

Meanwhile in the RSFSR Criminal Code there is Article 141 (the criminal codes of the other union republics also contain similar articles), which provides for the criminal law protection of the personal nonproperty rights of authors. In accordance with this article the publication under one's own name of someone else's work or other appropriation of the authorship to such a work, as well as forced collaboration are a felony and are liable to the corresponding punishment. Unfortunately, the people, on whom the imposition of the penalty of this article depends, almost do not use it, while the rare cases of imposition are not becoming accessible to the public at large.

In most instances the real author is interested not so much in the punishment of the guilty party as in the restoration of his authorship and in the notification of the scientific community of this. Therefore plagiarism is also regarded in the Civil Code of the RSFSR and the other union republics as a civil offense. Article 499 of the RSFSR Civil Code specifies clearly the group of people, who have the right to demand the protection of infringed rights, and how they are restored.

Owing to the state organization of publishing the deliberate appropriation and publication under one's own name of someone else's work as a whole are practically not encountered in our country. However, one frequently has occasion to come across partial textual borrowing from someone else's work, and not only in dissertations, but also in published works. It should be emphasized that the law provides for individual cases, when a scientific work can be used without the permission of the author. First of all this is the citation of someone else's idea in the form of a paraphrase of this statement or in the form of a verbatim quotation, which is placed in quotation marks, with the mandatory indication of the name of the real author and the source of borrowing.

Unscrupulous authors often include the content of someone else's work with negligible alterations in a new work without the observance of this rule. Such instances, when there is a reference to the used material, but it does not give a proper idea of the scale and nature of the borrowing, are also observed, and this is also recognized as illegal.

It is necessary to stress that all this applies only to already published works. Therefore, in Article 476 of the RSFSR Civil Code much attention is

devoted to the precise indication of the attributes which attest that the publication of the work has occurred. In conformity with this article and Paragraph 58 of the above-mentioned "Statute on the Procedure of the Awarding of Academic Degrees and the Conferment of Academic Titles" abstracts of dissertations, which have been prepared by typographic means, but with the mark "not for publication," cannot be considered a printed work which has been published. Therefore, one cannot use for citation an abstract, and especially the dissertation itself or scientific reports, which are held at state libraries and are not for publication, without the consent of the author. Precisely of the author, since in Article 483 of the RSFSR Civil Code it is indicated that the copyright to a work, which was written even by way of the fulfillment of an official assignment at a scientific or other organization, also belongs to him, and not to someone else. By virtue of this it is impossible to recognize as correct the widespread opinion that it is possible to freely borrow material from official or departmental instructions and recommendations and to publish it in one's own name. The publication in the name of the director of an organization or institution of materials, which contain information from scientific reports, which were done by another author or even a collective of authors, without references to the immediate performers is also considered illegitimate. Consequently, the writers of individual and collective scientific reports, instructions and decrees can protect their copyrights without any restrictions.

A specific procedure of the publication in the press of information and excerpts from dissertations is established by special instructions. Here it is indicated that references to them are permitted only with the written permission of the author, which has been certified by the director of the institution at which he works. That is how one should also act with respect to abstracts. Unfortunately, some directors of scientific institutions do not know or deliberately ignore these instructions, to which the inclusion of abstracts in the bibliographies of many dissertations attests.

The talks and disputes concerning to what extent borrowing from the works of others is permitted, should be considered pointless. The use of already published works in the interests of society, which is predetermined by the very essence of the creative process, is regulated by Article 792 of the RSFSR Civil Code. This article permits without the consent of the author and without the payment to him of royalties the reprinting of individual works of the author or excerpts from them in scientific and critical works, educational and political educational publications within the limits which are established by the decrees of the RSFSR Council of Ministers. At present Article 5 of the decree of the All-Russian Central Executive Committee and the RSFSR Council of People's Commissars of 8 October 1928, "On the Copyright," in accordance with which the permissible reprinting from the works of one author cannot amount in a work by one title to more than 10,000 typographical characters for prose and 40 lines for a poetic text, retains its force in the RSFSR. From major scientific works (not less than 30 author's sheets in size) the reprinting of 40,000 typographical characters is permitted. Such reprinting is permitted, of course, only with the mandatory indication of the name of the author, whose work was used, and the source of borrowing. In case of the exceeding of the indicated norms the author of the cited work has the right to royalties for the entire reprint as a whole. Thus, in this case it is a question of the

dispute only over the property rights (that is, the right to royalties) of the author.

From practice it is well known that precisely such disputes in most cases become the subject of a hearing and usually are resolved without particular difficulties. The courts have to consider significantly more rarely questions of the restoration of the infringed nonproperty rights of the actual authors, since the latter, apparently, out of ignorance make little use of the possibility, which is established by law, of legal copyright protection.

The methods, by means of which the rights of the author can be restored, are enumerated in Article 499 of the RSFSR Civil Code. For example, after publication of a work with unauthorized borrowing the court or another competent organ can make it incumbent at the expense of the guilty party to give an advertisement in the press on the committed infringement of copyrights. It is impossible not to admit that this step is also used extremely rarely.

In speaking about the circumstances, which contribute to the appearance of plagiarism, one should note the irresponsible attitude toward the assigned job of managers and title editors. They should not only be competent in the substance of the problems, which are discussed in the work to be published, but also have a certain amount of legal knowledge.

In conclusion it is necessary to further indicate that in 1967 the plenum of the USSR Supreme Court adopted the special decree "On the Practice of the Consideration by the Courts of Disputes Which Follow From a Copyright," in which the attention of the courts is directed to the fact that they, having established instances of plagiarism or another infringement of the copyright law, are obliged by a special ruling to bring it to the notice of the appropriate organizations or officials for the taking of steps of public influence or disciplinary punishment.

Thus, prevailing Soviet legislation makes it possible to combat successfully such phenomena as plagiarism, as well as other infringements of personal copyrights. It is necessary merely to know thoroughly and to fulfill steadfastly the regulations established by law.

7807
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PATENTS AND INVENTIONS

PROBLEMS OF DEVELOPMENT OF USSR PATENT SERVICE

Moscow SOVETSKAYA ROSSIYA in Russian 12 Apr 85 p 2

[Interview with I. S. Nayashkov, chairman of the USSR State Committee for Inventions and Discoveries, by Ye. Temchin, SOVETSKAYA ROSSIYA correspondent, 11 April 1985]

[Text] Yesterday, the USSR State Committee for Inventions and Discoveries registered the 300th discovery, "Patterns of Radical Chemical Reactions." This fundamental paper discloses the role of electron-nuclear magnetic interactions in chemical reactions and discloses new possibilities of controlling them. Ye. Temchin, correspondent of SOVETSKAYA ROSSIYA, met with I. S. Nayashkov, chairman of the USSR State Committee for Inventions and Discoveries, just before the registration. Our dialogue deals with problems of development of the nation's patent service.

[Question] Ivan Semenovich, inventions and discoveries play a large part in accelerating scientific and technological progress. Recently, one has occasion more and more often to hear that inventions usually accompany a discovery.

[Answer] This is correct. A discovery makes it possible to view a problem in a different light and solve it from basically different vantage points. I am referring to the practical solution of applied problems.

[Question] Why is it that about half of the 150,000 applications for inventions that are submitted on the average to the committee are rejected by state experts?

[Answer] This is indeed so. Probably, the main reason is that the applicant did not make a thorough enough patent search or made it incompetently. Experts are compelled to deny the applicant expressly because his proposal does not contain the element of novelty required for an invention. What the author proposes has already been invented and, consequently, is not new. In this regard, there is something I must say. About 90 percent of the applications are sent in by individuals who work at institutes and industrial enterprises. However, they are very often not accompanied by sufficient patent information. This happens because there are too few local patent services, and the qualifications of their staff often leave much to be desired. The developer himself has to search for the needed information, and this requires some knowledge and skill.

[Question] How do you explain the fact that patent services are not equally well developed in all areas?

[Answer] Unfortunately, not all enterprise or institution administrators attribute proper importance to such services. This is one of the reasons. But one cannot develop new equipment without using information about inventions that exist in the world. Expressly inventions are the most objective indicator of the level achieved in some area of engineering and technology.

A new GOST has been in effect since the beginning of last year, according to which patent studies are mandatory on all levels related to development of new equipment. The first phase is preparation of an engineering task for a design and then patent studies in the designing process.

[Question] Do you expect that this step will play a deciding role in organizing such services?

[Answer] At any rate, the situation should change for the better. The administrators who had underestimated the importance of patent investigations will be compelled to revise their opinion.

[Question] In a talk about services, the general director of one of the enterprises showed me the wage rates and skills handbook of the USSR State Committee for Labor. Patent specialists are not listed in it. He then explained that the administrators who established these services are breaking labor laws. Individuals are listed on engineering and technical jobs, but work as patent specialists. Any commission that would discover this could raise the question of punishing the director.

[Answer] This question will be resolved in the very near future, and the patent specialist will take a leading place at scientific research institutes and design offices. His status will change.

[Question] In recent times, we have been hearing and reading more and more often that new equipment should be developed on the invention level. How is this to be interpreted?

[Answer] I already stated that the presence of inventions is the most objective criterion of novelty in equipment and technology that are being developed. Before issuing an engineering task for a design, one must pay attention expressly to this circumstance and proceed expressly from it. Furthermore, demands must be made of the developer that the indicators of his future design or technology would be ahead of the level reached by that time.

[Question] Do you believe that this is sufficient not to have designs of machinery and technologies appear that are not inferior to the level achieved in the world? By that time, when designing is finished, inventors could develop something better....

[Answer] Of course. This is why we believe that patent investigations must be conducted at all stages of designing. Moreover, the requester must also not disregard this work.

[Question] How do you view this?

[Answer] There are scientific research groups under the subordination of each ministry which must formulate a task on the basis of patent investigations and their analysis, and they must also provide a conclusion upon completion of the work.

[Question] This means that, again, everything depends on patent services. But I know of institutes where these services consist of 2-3 people. They barely have time to handle applications, let alone pursue investigations and analyses.

[Answer] Of course, underestimation of the effectiveness of such services has a devastating effect on the technical sophistication of products that are put out.

[Question] What should be the job of a patent service?

[Answer] There are many tasks. It should help developers write up applications for inventions, search for necessary information, analyze it, recommend the most promising directions, in which a new technical developments should be sought. This is expressly how patent work is done at the Moscow Motor Vehicle Plant imeni Likhachev, the Leningrad Metallurgical Plant Association and Tallin RET Production Association. When patent work is set up well, it is largely instrumental in development of really new equipment and technology by these enterprises and institutes.

[Question] Thus, a patent specialist is one of the principal figures in developing something new in engineering?

[Answer] Yes. I should like to add that we need patent specialist-jurists, patent specialist-researchers, analysts and forecasters. In this respect, we already have the experience of progressive institutes and enterprises. It should be disseminated everywhere. All these job titles should be added to the list of regular staff, on a par with engineering and technical positions. And there is something else I should like to say. Considering the importance of patent information, technical VUZ's should train specialists with sufficient knowledge in the area of patent and licensing work.

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PATENTS AND INVENTIONS

PROBLEMS WITH FOLLOW-THROUGH ON INVENTIONS AND INNOVATIONS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Mar 85 p 2

[Article by K. Taksir, doctor of economic sciences, Moscow: "Contract for Introduction--A Specialist's Opinion"]

[Text] New technology is responsible for over half of the entire increase in labor productivity under the current Five-Year Plan. Each year, it saves 2.5 billion rubles due to reduction of production cost, and it helps conserve the labor of just under half a million industrial workers. Of course, these are impressive achievements, but they could be much greater. Our country has an enormous scientific-technological potential, but frankly speaking it is not used in the optimum way.

Judge for yourselves. Only one out of every three inventions finds its way into implementation, and even then often with delay. As compared to the last year of the 10th Five-Year Plan, there has been an appreciable decline in share of inventions used within the first 3 years of their development. What is particularly alarming is that there is a decline in share of major and particularly effective inventions among all those that are introduced. Not infrequently, other countries that have purchased licenses for Soviet innovations overtake us in using them. This was the case with continuous steel casting. Or else, consider the dry method of producing cement. It is being introduced in our country for 3 decades already; however, only 16 percent of the production uses this method. Compare this to the following figures: 78 percent in Japan and 90 percent in FRG. Yet each of these percentage points is tantamount to a savings of about 60,000 tons of comparison fuel per year.

I am convinced that such inventions are the main reserve for accelerating scientific-technological progress. For this reason an inventory must be taken of all significant inventions, the most effective ones must be selected and proper programs of implementing them should be prepared.

This could be done by the interagency commission under the USSR Gosplan in coordination with ministries and agencies. If necessary, the commission would recommend refinement of innovations at institutes and design offices to a level that would be suitable for introduction. Then the USSR Gosplan, ministries and agencies provide for specific tasks in five-year plans for assimilation of the selected innovations. The sectors decide which enterprises and building projects will implement the innovations. The executors, with the rights of

co-authors, together with sector scientific, design and technological organizations, prepare for production in advance. The plans of sectors and associations must provide for the ultimate technical and economic results, deadlines and stages of work all the way to series manufacture of a new product and introduction of progressive technology.

It would be worthwhile to add a special subsection, "Implementation of Major Inventions," to the section of "Planning of Science and Technology" in the national economic plan. We are not referring to their formal distinction in the overall list of innovations. Such an item in the plan would make it compulsory to achieve coordination of tasks with capital investments and back them up with resources. Of course, these tasks must also be reflected in the plans of executors.

Thus far, planning of scientific work has not, in essence, been tied in with financing. Moneys are not allocated for specific tasks, but for upkeep of scientific institutions. And, this is done regardless of the quantity and importance of the problems investigated. This practice must be changed at the start of the 12th Five-Year Plan. Project plans of sector scientific research institutes must be based on assignments pertaining to effective inventions. The difficulties should not be exaggerated, for as a rule the basic research that is promising for use in practice is already known, and specialists are aware, with a high degree of certainty, development of which projects will evolve into inventions. Of course, one should assess the performance of scientific research institutes and grant authorship awards only with due consideration of the impact of innovations.

The impact of innovations in general and inventions in particular depends largely on the scale of introduction. And that is where we obviously have problems. A development is considered introduced as soon as at least one unit is tested. About 70 percent of the research work ends expressly at the stage of experimentation or development of an experimental prototype. As shown by analysis of the Institute of Economics, USSR Academy of Sciences, of all projects listed as introduced, 85 percent have been implemented at only one or two enterprises, and only 1-2 innovations out of every 100 are introduced at 5 enterprises or more. At least 2 years elapse between completion of the work and its practical execution. By far not all projects conform to the world's best specimens or are superior to them. This applies even to the particularly important innovations that were included in the Gosplan.

One of the main reasons for these problems is that innovations are introduced by the so-called industrial method. The plants prepare the draft documentation themselves, they manufacture nonstandard equipment, procure materials, instruments, lathes and perform construction and assembly work. Plant services responsible for updating production have little power, they are often not competent enough, while other departments are busy with current production and have no time for innovations. Moreover, there is an insufficient reserve with regard to capacity, financing and physical resources to take on a new technology. For example, in the Ministry of the Electrical Equipment Industry only one-tenth of all experimental work is done using plant resources, even though this ministry is considered to be in the lead in the sense of technological progress. Only 0.3 percent of capital investments are allocated for development of experimental bases of enterprises referable to 41 ministries and agencies.

Introduction of innovations by the industrial method is excessively costly and mainly use of an innovation is localized: each enterprise is concerned only about its own needs.

The contract method is more expedient, i.e., using specialized organizations concerned with introduction. In this case, all stages of work are coordinated from a single center, while the overall effect of using an innovation in industry serves as the end product of such an organization. The firms concerned with introduction are, so to speak, intermediaries between science and industry. By the very meaning of their existence, they direct themselves to mass scale use of new equipment and technology in the national economy, rather than isolated use. This means that, along with scientific production associations, they are best suited for fullest use of the nation's accumulated scientific and technological potential.

Such firms already exist. Let us mention, for example, Innovator, a technological design organization in Baku, and the Effect special technological design office. Energotekhprom is an experimental enterprises that has demonstrated excellent results. Within a short time, it introduced to 57 plants standardized technological lines for the manufacture of prestressed vibration pads and attachments. There are all the necessary departments for implementation of innovations in the structure of Energotekhprom as, incidentally, in other organizations of this type. They are able to implement work at many enterprises at a time, successively covering all phases of introduction. For this reason, it also takes an average of three-fifths the time to accomplish.

Unfortunately, there are few such firms as yet. And there is no evidence that their knowhow is much appreciated in the sectors. For example, the USSR Ministry of Power and Electrification is gradually diverting the Energotekhprom experimental enterprises from its immediate duties. At the present time, no more than one-fifth of its potential is being used for introduction work, its capacities are burdened primarily with manufacturing series-produced goods.

Experience has also confirmed the benefit of intersector contractor firms. And this is understandable: the area of application of an innovation is not usually limited to a single ministry. Considerable achievements have been made by the Transprogress Association under the RSFSR Council of Ministers and the scientific production association for powder metallurgy under the Belorussian Council of Ministers. Why not establish such firms under the USSR State Committee for Science and Technology or, let us say, the Central Committee of VOIR [All-Union Society of Inventors and Efficiency Experts]?

Things would advance faster if the obstacles that such organizations still encounter were eliminated. The planned and estimated indicators set for them take into little consideration the place and purpose of this element in the "science-industry" system. For them, as for ordinary enterprises, plans are made primarily of the overall volume of production, although their goal is different, it is to introduce innovations.

We believe that there are two main indicators to be considered here: the actual effect for the national economy and overall output. The latter should include scientific research and experimental design work (primarily on the

level of inventions), manufacture of experimental prototypes and small series of products, adjustment and assembly work, services dealing with introduction and assimilation of innovations. As for the economic effect, a full record is not yet even kept about it. Yet it is quite apparent that not only evaluation of the work, but incentives must be tied in with its actual level. The additional profit collectively provided by innovators should be distributed among all enterprises that participate in assimilating new technology.

Life itself has developed a mobile and dynamic organizational form of link between science and industry. Development of contractor organizations dealing with introduction is the sure way toward accelerating scientific and technological progress.

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SOCIO-POLITICAL FACTORS

SOCIAL AND METHODOLOGICAL PROBLEMS OF SCIENTIFIC AND TECHNOLOGICAL PROGRESS

Moscow SOTSIALISTICHESKIY TRUD in Russian No 2, Feb 85 pp 123-124

[Article by M. Rubinshteyn, candidate of economic sciences]

[Text] The central economic and important political task for the CPSU, for the entire Soviet people, is to accelerate development of science and technology, make extensive and highly efficient use of the results of research and development in industry, as well as in other aspects of life of society.

In this regard, investigation and knowledge of the socioeconomic mechanisms of control of scientific and technological progress, its essence, trends, patterns and laws, diverse relations and contradiction of development acquire particular importance. Increasing attention is being given to investigation of these problems and development of specific measures to solve them, in particular, at theoretical and methodological seminars, meetings, conferences and symposiums. Thus, in recent times alone, the following All-Union conferences have been held: "Economic and Organizational-Legal Problems of Improving the Mechanism of Control of Scientific and Technological Progress" (Moscow, 1983), "Development of Scientific and Technical Creativity of Workers" (Tashkent, 1983), "Problems and Routes of Accelerating Scientific and Technological Progress" (Kiev, 1984) and several others.

In late 1984, the All-Union conference on "Social and Methodological Problems of Scientific and Technological Progress" convened in Moscow. It was organized by the USSR Academy of Sciences, Scientific Council for Philosophical and Social Problems of Science and Technology, the Central Council of Philosophical (Methodological) Seminars and Institute of Philosophy. Responsible officials from the USSR State Committee for Labor and Social Problems, USSR State Committee for Science and Technology, USSR Academy of Sciences, Ministry of Higher and Secondary Specialized Education, Central Board of the All-Union Znaniye Society, scientific associates of academy and sector institutes, VUZ professors and instructors from Moscow, Leningrad, Gorkiy, Kiev, Minsk, Novosibirsk and other cities of the country participated in the conference.

In his opening remarks, Academician P. Fedoseyev, vice-president of the USSR Academy of Sciences, demonstrated the role of scientific and technological progress in a developed socialist society in increasing labor productivity, intensifying the production process and reproduction as a whole, as well as

improvement of the socialist life-style. The speaker devoted special attention to the contribution of researchers, developers, all those who create and use new equipment and progressive technology for successful implementation of the Combined Program of Scientific and Technological Progress, the Energy and Food programs, as well as Program of Production of Consumer Goods.

He stressed the need for complete and accurate consideration of the increasing significance of the human factor, the requirements that scientific and technological progress imposes on organization of work and working conditions, training and retraining personnel, their ability to adjust rapidly to new production conditions, to display initiative and interest as participants of scientific research, experimental design and technological work, to develop, introduce and make broad use of technical innovations.

The speaker indicated that one of the most remarkable features of our times is acceleration of scientific and technological progress, the starting point and basic form of which are successively developing revolutionary breakthroughs in different branches of science and engineering. NTR [scientific and technological revolution] has a profound influence, not only on technology but social relations, on man himself, his work and environment, on the international situation and all worldwide development. Analysis of the prospects and tasks of scientific and technological progress in a socialist society is the main thing for us. Use of achievements of the NTR in the interests of development of socialism and the cause of peace is a task of vital importance.

Academician Yu. Ovchinnikov, vice-president of the USSR Academy of Sciences, characterized the basic directions of scientific and technological progress in our country and demonstrated, using concrete examples, the increasing significance of biotechnology and its most important achievements. He specially emphasized the fact that Soviet biology has reached a worldwide level. True, we are still behind the United States in scope of work, unfortunately.

Academician A. Yanshin devoted his paper to the role of science in solving problems of environmental protection and wise use of natural resources. At the present time, petroleum, coal and natural gas yield up to half the cost of our exports.

Science is making an increasingly important contribution to providing economical methods of recovery, transportation and use of mineral resources, development of a set of long-term measures for environmental protection, wise use of land, water and air basins. Broader use is being made of drilling extra-deep wells. For example, the well in Kola is 12.1 km deep. Experimental mineralogy has made significant strides.

In his paper dealing with scientific and practical aspects of modern energetics, Academician V. Kirillin discussed in detail the significance and structure of the Energy Program, the stages of its implementation; he described the contribution of scientists to development of this program, disclosing its role in social and economic development of the nation, as well as in acceleration of scientific and technological progress. It was noted that there is extensive construction of nuclear electric power plants, as a result of which use of organic fuel is stabilizing. It should be stressed that the nuclear fuel resources are

unlimited. The nuclear electric power plants themselves, which embody the latest scientific-engineering advances, are built in such a way as to preclude a threat to the environment and human health. Work is being deployed on recovery of liquid motor fuel from coal, use of renewable sources of energy and energy-conserving technological processes. Our country, which is a pioneer in centralized heating, holds a leading place in the world today in this field. On the whole, the Energy Program is a program of future development, in which there is reflection of all of the most important strategic directions of improvement of the power-generating fuel complex.

Academician A. Yegorov disclosed the basic theses of Marxism-Leninism concerning the laws of scientific and technological progress, the organic correlation between scientific-technological, economic and social progress in a developed socialist society. He analyzed the increasing intensification and differentiation of sciences, the need to think about how one can increase the biosphere's capacity to reflect the adverse sequelae of scientific and technological progress; he discussed the general problems of mankind that arise with the scientific and technological revolution. It was stressed that scientific and technological progress is related to advances, not only in natural and engineering sciences, but social sciences. In theory and practice, the idea of merging of NTR [scientific and technological revolution] with social revolution must be evident. This requires making a distinction between dialectical contradictions of socialism and the contradictions that arise due to errors and oversights in development of the economy. For example, it is important to reconcile the discrepancies between the needs of industry, its new engineering level and worker qualifications. It is necessary to take into consideration intensification of moral factors in labor, the fact that man is still the main productive force, the bearer of social relations.

In his speech, Academician D. Gvishiani analyzed pressing problems of forecasting development of science and technology, indicating that the Integrated Program of Scientific and Technological Progress is the most important preplan document. In the opinion of this speaker, the importance of forecasting scientific-technological work and programs will grow, since it is necessary to make an integral evaluation--technical, economic, social--of their consequences. We need a system for revision of forecasts on the basis of new information. Consideration of the unity of principles of systems analysis and development has a deciding effect on the solution of concrete problems. The orientation of scientific and technological progress toward specific social results implies primarily reduction of the share of manual labor and development of flexible automated industry. Scientific and technological progress itself can be defined as the aggregate of all measures that improve the socioeconomic effectiveness of all aspects of social life. During the period of NTR, there is an increase in importance of long-term anticipation of trends in development of science and technology, development of conditions for purposeful control of the process of developing and implementing innovations. The Integrated Program of Scientific and Technological Progress provides for faster development of sectors that stimulate progress, as well as sectors that slow down the growth of the national economy. This applies to the machine-building complex, production of consumer goods.

Questions of correlation between rate and scope of effectiveness of development of engineering sciences and engineering activity were analyzed

in the paper of Academician V. Rzhevskiy, who pointed out the basic directions of their improvement under NTR conditions. He stressed the need to raise the prestige of engineering and technical education, overcome the negative trend toward holding fewer competitions for entrance examinations to technical VUZ's, provide favorable opportunities for growth in efficiency of the work of engineers, designers and technologists.

There were five sections at the conference, at which speeches were delivered and discussed on such problems as the moving forces of scientific and technological progress, incentives and motives of scientific work, providing a favorable moral and psychological climate in groups, as well as the necessary social and economic conditions for research, development and innovations, material and spiritual encouragement of participants in scientific and technological work and programs, mathematization of engineering work and modern industry.

Several speakers discussed pressing problems of development of the education system under conditions of the NTR, including training and wise use of scientific personnel under conditions of intensification of scientific work, control of quality of training scientific and pedagogic personnel with the highest qualifications, problems of NTR in the educational course o Marxist-Leninist philosophy, secondary specialized schools and tasks of accelerating scientific and technological progress, methodological problems of training engineers in higher educational establishments, correspondence training of specialists of a new type, training personnel in new specialties related to the needs of scientific and technological progress, training specialists in the area of management of scientific research work, economic and social aspects of development of education.

The conference participants analyzed the tasks of scientific-technological propaganda in the light of the decisions of the Party and government concerning acceleration of scientific and technological progress in the national economy, guidelines for propaganda of science, the role of mass media in disseminating scientific and scientific-technical information, the systems approach to propaganda of scientific achievements, specifics of propaganda of scientific and technological achievements for young people, problems of international exchange of books in the field of science and technology, the role of scientific books in propaganda of achievements of the USSR in other countries, impact of Soviet knowhow on development and implementation of international UNESCO plans.

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GENERAL

DISCUSSION TOPICS, OFFICER ELECTIONS AT MEDICAL ACADEMY'S ASSEMBLY

MEDITSINSKAYA GAZETA in Russian 10 Apr 85, No 29 (4474), p 3

[Text] The article summarizes the discussion of reports and papers given at the 53d session of the general assembly of the USSR Academy of Medical Sciences (AMN SSSR). The assembly discussed results of work in such areas as medical enzymology and genetics; virology and immunology; higher nervous activity; advanced diagnostic technology; and new methods of treating infected wounds and extensive burns.

Recipients of awards presented at the assembly are identified, and results of elections of officers are announced. Academician N.N. Blokhin was re-elected president of AMN SSSR. S.S. Debov, L.A. Il'in and Yu. I. Borodin were elected vice-presidents of AMN SSS. D.S. Sarkisov was elected chief scientific secretary of AMN SSSR. Academician Ye. I. Chazov and AMN SSSR members V.I. Votyakov, O.K. Gavrilov, N.G. Inanov, A.N. Konovalov, M.I. Kuzin and A.P. Romodanov were elected members of the academy's presidium. The appointment of Yu. I. Borodin, member of AMN SSSR, as chairman of the presidium of the academy's Siberian Branch was confirmed at the assembly. Appointments of the following members of the academy as academician-secretaries of academy departments were confirmed: department of clinical medicine--V.A. Nasonova; department of medical-biological sciences--G.N. Kryzhanovskiy; department of hygiene, microbiology and epidemiology--O.G. Andzhaparidze.

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GENERAL

ESTONIAN ACADEMICIAN TAMM ON WORK, EDUCATION, ACTIVITY AS DEPUTY

Tallinn SOVETSKAYA ESTONIYA in Russian 23 Jan 85 p 2

[Interview with Academician of the Estonian SSR Academy of Sciences, Doctor of Technical Sciences Boris Georgiyevich Tamm, rector of Tallinn Polytechnical Institute, honorary doctor of the Technical University of Budapest, foreign member of the Finnish Academy of Technical Sciences, first vice president of the International Federation of Automatic Control and deputy of the Estonian SSR Supreme Soviet, by L. Torshina: "Able to Work, Think, Decide"]

[Text] Boris Georgiyevich Tamm is the rector of Tallinn Polytechnical Institute, a doctor of technical sciences, an academician of the Estonian SSR Academy of Sciences, an honorary doctor of the Technical University of Budapest, a foreign member of the Finnish Academy of Technical Sciences, first vice president of the International Federation of Automatic Control, to which the most prominent scientific organizations of more than 40 countries of the world belong, and a deputy of the Estonian SSR Supreme Soviet. B. G. Tamm has been renominated to be a deputy of the highest organ of power of the republic.

Boris Georgiyevich rises from the rector's chair, sits opposite me on a small magazine table and the interview begins. This is the instance when the costs of the difficult occupation of a journalist are completely offset by the festivity of a meeting with a really interesting person.

[Question] "Boris Georgiyevich, as is known, your activity is very versatile. Let us begin the conversation about you as a scientist. What problems are you now dealing with?"

[Answer] "For a long time, a whole 17 years, I worked at the Institute of Cybernetics. We organized there, obviously, the first programming bureau in the Soviet Union--back in the 1960's, when it became obvious that the development of artificial intelligence for computers was becoming an independent science, even an independent sector of industry. The Special Design Bureau for Computer Technology of the Institute of Cybernetics, which at present is one of the most authoritative organizations in this direction in the union as a whole, later on developed from this bureau.

"I made such an introduction because I want to emphasize: I have remained loyal to modeling, first of all of human intelligence. For this is a key issue--to derive from computers, which have fantastic parameters, the greatest benefit, to teach them to perform exclusively intellectual work. For example, on designing, in which an enormous mass of people are presently engaged."

[Question] "You are not only a scientist. At your higher educational institution an important task is being accomplished: the training of highly skilled specialists and at the same time organizers and managers of production and scientific collectives. As we know, this is spoken about in the decree of the CPSU Central Committee 'On the Participation of Managerial Personnel of the Estonian SSR in Political Educational Work Among the Workers.'"

[Answer] "Yes, this is one of our main problems. From my own experience I can say that a good organizer first of all should see clearly the goal for which he is striving. The second necessary quality is: a sensation and understanding of the methods by which it is possible to achieve this goal. And the third very essential feature of organizing activity is: a realistic idea about, as mathematicians say, what initial conditions you have. That is, what manpower, material and technical resources you have. Without clarity in these questions it is difficult to work with people. But it is also necessary to develop communications skills at the higher educational institution. For example, last year within the experiment we began to teach psychology in several of our technical specialties. Everything, strictly speaking, also begins with this. And we intend to continue the experiment.

"In my opinion, it is also extremely important to develop independence in students. We frequently accuse young people of the lack of initiative and the inability to think independently. But it is not they, but we who are to blame. At times we describe everything for them: do this with the left foot, this with the right, now sit, and now stand up. Let they do it themselves, though not as we do it, but themselves. The fact that among the graduates of secondary schools, our matriculants, though rarely, there appear quite outstanding boys and girls, is a result of the fact that they somehow managed to avoid excessive organization. But if they did everything that was envisaged for them by the plan, they simply would not have time to improve themselves in the field for which they felt a longing. Thus, during their free time they themselves read something or did something in order to gain more knowledge than what the school gives and to raise themselves much higher than the average level. And precisely this is especially valuable in our life."

[Question] "Is such an approach to the problem, apparently, based on personal experience? Dare I say that family upbringing has an effect?"

[Answer] "No. I have told much about this and, perhaps, somewhere will repeat myself. My friends, together with whom I studied and who today work close by, had the basic influence on my choice of occupation. For example, my classmate Kal'yu Leppik is now the director of the Special Design Bureau of the Institute of Cybernetics. Or Uno Liyv. Last year he defended his

doctoral dissertation, he is a hydraulic engineer and works at Tallinn Polytechnical Institute. There is Yullar Yygevest, with whom I shared the same desk. Now he is a leading engineer at the Institute of Cybernetics.

"While in my family upbringing there were two main features--diligence and decency. They often ask me the question: How do the young people, who are now enrolling in the institute, differ from my generation? I reply that they are not in the least worse, but there is, unfortunately, one difference: they taught us more to work in a concentrated manner. We, if it was necessary, could work 10 hours a day and 10 days in a row."

[Question] "Did they school you more in diligence, regardless of what work you were busy with?"

[Answer] "Yes. They forced us to demonstrate our trained ability by work."

[Question] "Boris Georgiyevich, you are a member of the Presidium of the Estonian SSR Supreme Soviet. What aspects of the activity of a deputy give you the greatest satisfaction?"

[Answer] "You know, the question is quite difficult, because I sense myself to be a Soviet individual with all his rights and duties everywhere. Whether I am working on administrative questions or scientific questions or am taking part in the meetings of the Presidium of the Supreme Soviet. For example, I addressed a session of the republic Supreme Soviet and said that the school training of our young people, especially in mathematics and physics, is organized here, in my opinion, worse than in other republics. I spoke as a person who knows this field, but spoke precisely as a deputy. This was on the eve of the school reform. Now these questions will be settled. Moreover, as a result a mathematics society was organized, an action group, which now works under the auspices of the Ministry of Higher and Secondary Specialized Education and the Ministry of Education, was gotten together. It coordinates and poses in a new way the questions of the teaching of mathematics in our republic. Of course, this work will yield fruits not immediately, but a small step forward has been taken, and I had a little influence on this matter."

Boris Georgiyevich tells about his work as a deputy, but I remember. On the last Thursday of every month I attend the meeting of the Presidium of the republic Supreme Soviet and see at work Presidium Member B. G. Tamm. Whether a question concerning the letter of a voter on the comprehensive service of a Kokhtla-Yarveskiy Rayon settlement or on the problems of the rural school is being discussed or it is a question of the forms of service of single elderly people, Deputy Tamm never maintains silence. Life's experience, competence, erudition, scrupulous preliminary study of the issues being discussed and, I would say, some heightened interest in improving the life of man also create that approach to the settlement of matters, which is called the state approach.

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GENERAL

CRISIS OF INDIVIDUALISM IN SCIENTIFIC SCHOOLS

Moscow LITERATURNAYA GAZETA in Russian No 12, 20 Mar 85 p 11

[Article by Professor Boris Khorev: "Not Recommended for Reelection"]

[Text] This happened at a large faculty of a leading higher educational institution of the capital: a senior scientific associate was not reelected to a position and was dismissed. Is it a ordinary matter? Event? How is one to look at it?

Let us, however, give the floor to victim himself--I will call him Borisov. My old fellow student and contemporary, he sent me a copy of his statement addressed to the chairman of the auditing commission of ministry. More precisely, this is an entire epistle. I will cite excerpts, having specified in advance that Borisov is a very original, very categorical person, who has maintained in his 50 years quite a number of naive ideas. So that it is possible not to agree with him on everything, while something, probably, will evoke an ironic smile. But only something. As a whole acquaintance with his "statement" suggests sad thoughts.

"I have worked at the higher educational institution," Borisov writes, "continuously for 19 years, have published 82 scientific works with a total volume of 58 author's sheets, of them 17 works have been translated and published abroad.... The former chief of the chair supported me, but after his death the atmosphere in the chair quickly changed. My scientific direction became offensive, while it became difficult to publish in the bulletin of the higher educational institution on this theme. Only dissertations and organizational questions were examined at the meetings of the chair, while scientific reports became a rarity. Capable young scientists are spending all their working time on bureaucratic procedures, run with documents and are forced to meet 10 times a week. Of course, such a situation suits very many people, but science in our chair because of this is not developing, new scientists are not developing, there is no one to replace the retiring professors in the majority of directions. The chair has ceased to be an all-union center of scientific thought in its field....

"...During recertification in the chair they accused me of violations of discipline and of being isolated from the collective, but there were no comments on the quantity and quality of scientific work. After lengthy

discussion they gave a positive judgment: 'A prominent scientist, works a lot, creates prestige for the chair.' The petition on my reelection to the position of senior scientific associate was unanimously accepted by the chair and the council of the department of the faculty.

"After this the decree of the faculty competition commission, in which it was asserted that I had written almost nothing in the past 5 years on planned themes, therefore the commission does not recommend me for reelection, was unexpected for many. The doctoral dissertation and monograph, on which with the knowledge of the management I had spent a large part of my working time, were declared not to have a bearing on the scientific interests of the chair. 'The works of Borisov,' it was stated at the meetings of the competition commission, 'are not in keeping with the high level of the higher educational institution, therefore he does not have his works published in the bulletin of the higher educational institution, but publishes in an outlying area, where the scientific level is lower than here--in Leningrad, Tartu.' If some people believe that Tartu or Leningrad University is a remote province, they will themselves soon feel that they are on the periphery of their own field of knowledge.

"...Scientists from other faculties and from other scientific organizations, who had come specially to hear my case, attended the meeting of the council of the faculty, at which my question was considered, but there was no discussion.... The voting took place on the basis of misinformation. This gives me the right by way of appeal to demand a review of my case--not because I hope to change the results of the vote in my favor, but because I want to say publicly exactly what I am writing about.... I am not pursuing any special goals personally for myself, but am merely defending my honor and the prestige of science, particularly my scientific direction. But it is not that important for me what will happen with me personally."

Now a little history. Borisov in his day was lucky: as a student he was admitted to the faculty which was established by a most prominent scientist, whose name--and recently his 100th birthday was celebrated posthumously--constitutes the pride of an entire field of science. Borisov was his immediate student: he wrote under his supervision his course and graduation works. The lack of contact, perhaps, even the "individualism" of Borisov were noticeable back during his student years, but this did not prevent the director--I will call him here the Leader with a capital L--from rating highly his creative ability, from guarding, I would even say, from shielding him in every way and from developing his talent. Borisov was retained in the chair and successfully defended his candidate dissertation.

His works blended well with the scientific direction founded by the Leader. More precisely, this was an entire scientific school with numerous branches, one of which, in essence, was informally headed by Borisov, who with time acquired his own students and followers.

Why has he now been banished from the faculty? How could this happen?

It is hardly necessary to say what a good scientific school is. This is first of all a union of like-minded people in a specific field of knowledge, which

has been consolidated by traditions, by the continuity of scientific ideas and by much else.

The signs of the withering, even the crisis of the scientific school, to which Borisov belonged, have been described quite accurately by him. They appeared back during the life of the former chief of the chair, who, in general, continued the cause of the Leader, but became especially noticeable under the present chief--under whom Borisov was dismissed. Although this dismissal, perhaps, is exactly one of the symptoms of the mentioned crisis.

For the sake of fairness I should say that the new chief of the chair is a quite good person, with an excellent character, but then something is not happening. The faculty in general is actually overflowing with very nice people, which once again does not prevent the process of withering from developing.

What is the matter? I believe that hardly any one person is personally and specifically to blame for anything.

At times one has occasion to hear: the age of titans in science, which was due to the general postrevolutionary upswing, has passed--the time of complex collectives and monotonous hard workers has arrived. That is as it may be. It is possible, but debatable. During the life of the Leader there were also both hard workers and a collective. But there was also the Leader himself.

People frequently complain: young people are not developing, they are not yet personnel. Young scientists, meanwhile, have not become more stupid. On the contrary, they are better trained, educated and informed. But their scientific enthusiasm, so it seems to me, has begun to wane--everyday resourcefulness, on the contrary, has increased. The faculty, of which it is a question, in the literal sense of the word is being eaten away by the ulcer of coaching. "Capable young people" not only run with documents, they also do much work with future candidates for admission. The easy (and, I will add, very substantial) wages of coaches are gradually corrupting people, stimulate consumerist sentiments and, in the end, deter people from science. Borisov was also able to write tens of articles, many of which are well known abroad, because, I know this for sure, he did not engage in coaching. And, unlike many people, he did not pursue paid lectures along the lines of the Society for Knowledge.

I have one acquaintance precisely from that clan of "capable young people," who plunged into coaching and prospered extraordinarily in this business. Now this acquaintance of mine has already gotten an impressive paunch. He has acquired a four-room apartment with an enormous kitchen, a hall and two bathrooms, of course a car, had his apartment furnished, "chandeliered" it and plays the latest records. He is going on 40, but has neither a pamphlet nor even an explanatory article. Meanwhile he is a very capable person! And his wife, who is beautiful, intelligent, strong-willed and previously encouraged, let us face it, all this accumulation, is already beginning to get anxious and even to rebel: "What are you thinking about?", "Where is your doctorate?" and so on.

In general, the reproaches are belated: for science this man is already lost.

Though they will accuse me of whatever they like, I cannot but recall, in counterbalance, the generation of my fellow scientists: we, I dare say, began to think in earnest about material well-being after turning 40, and wrote doctoral dissertations in crowded little kitchens of small five-story apartment buildings.

And still the disease of coaching, on which I have dwelled in such detail, is not at all the original cause, but rather one of the symptoms of the crisis of the school, about which it is a question. If the genuine creative atmosphere, which always corresponds to the spirit of a real scientific school, is maintained, I am convinced, capable young people would abandon these jobs of theirs or, at least, would not devote so much attention to them. We are now also making not that bad a living at the place of service (although, perhaps, we are also not achieving that rapidly some material heights there, which, incidentally, are not at all essential). Coaching becomes a disease not always, but only when it turns into the main job, a kind of "business," while the work office is regarded as a "roof," and that is all.

Here is what especially interests me: Do we all understand sufficiently well how important it is to preserve a creative atmosphere at centers of science and higher education or to create it where such an atmosphere does not exist?

In one of his statements the new director of the faculty, who succeeded the Leader, emphasized that he regards as his main task "the greater unification" of the collective of the faculty, and in another "the better support" of the educational process. The goals, of course, are necessary and positive. But are they sufficient? If only the two named tasks are made the cornerstone, it is entirely possible in the faculty also to do without Borisov. Indeed, he is an "individualist" (but only in the sense that he prefers to work alone. By his nature he is reserved, "carries in himself" his own ideas until he implements them), a grumbler (many consider him rude) and did not participate as actively in the educational process as the professors and docents--he was, after all, a senior scientific associate and served in the faculty laboratory. In my opinion an entire set or, as is customary to say, a "tree of goals" is needed. The maintenance of a genuine creative atmosphere is one of them. Without it, incidentally, there will also be no properly united collective, and educational tasks will be accomplished with greater difficulty. But, in addition, a supergoal, a supertask is also necessary for the higher educational institution of the capital: Where, if not at it, can and should important scientific schools be developed and established? There is such a school--the support of the educational process, the comradely relations in the chair, in the faculty and, but of course, the creative atmosphere, I would say, as if are being reproduced on a permanent basis.

Perhaps, I am exaggerating, but, it seems to me, we have already wasted a lot on the fact that often we realized too late when one negative process or another had gone too far and everything, as they say, had become clear even to the last fool. It is time to give battle to this position--"from the last fool." Society is not indifferent to the fate of scientific schools. Without them there cannot be first place and leadership in the world in science, there

cannot be rapid and effective progress in domestic production, equipment and technology. This, if you wish, is our national property, our gold reserve.

We also cannot do without talking about the leaders of schools. It is difficult or else impossible for a school to develop without a prominent individual at the head. In our times in science they are beginning more and more to distinguish formal and informal leaders. In science there is sufficient room for many, each one can and should work on creative tasks, but only a few set the tone and affect the matter in any field. And the best version, in my opinion, all the same is when the formal and the informal leaders are combined in one person. Even sufficiently talented administrators, having been promoted to key positions, but without having the necessary range of vision and authority, frequently are incapable of ensuring a high scientific level of the schools.

As everywhere, in science it is possible to get to the top. It does not manage without the fact that at times people, who are devoted not so much to science as to a career, get to it. They "seize positions" (there is such a specific expression) and then by hook or by crook try to hold them. But they do not come up to the standard, that is the trouble. It is not terrible if a resourceful person proves also to be a very capable scientist--things can begin to move, but it is quite bad if there is resourcefulness, but just a speck of learning. Having seized positions, such people reproduce people like themselves, and then it is not that easy to get the better of them. The overall level inevitably decreases, that is where the misfortune is.

And another thing. Every sufficiently strong scientific collective needs a major cause in its field of knowledge. In our country much is being said about the spread of minor themes--this means in essence the breaking up of scientific problems and the absence of this very cause. The State Committee for Science and Technology and the Academy of Sciences are now actively pursuing a policy of the consolidation of themes and the combating of minor themes. Science of the higher educational institution for the present is lagging behind. Meanwhile a major cause in itself, given proper organization, can be a powerful motive force in the development of scientific schools, can educate the individual and can stimulate research.

I will end with what I began--I will return to the incident with Borisov, although the reader has probably already noticed that this event for all its individual importance (it is a matter, after all, of a quite prominent scientist) is merely a pretext for the discussion.

The Leader, who understood well the importance of the individual in science, liked to repeat that he regards as his main service as a scientist not at all monographs, but the attraction to the faculty of professor so and so. It must be confessed, he liked even to flaunt this phrase. We students, I remember, at first did not entirely understand him: the professor, of whom it is a question, at the lectures "did not produce an effect," and in his day he had not very many publications--except for the lectures, there was nothing to read. His books, which are now well known to all specialists, were prepared from manuscripts and articles by his students and were published posthumously.

In our case they not only did not attract but, on the contrary, banished Borisov, a specialist who is potentially equal in scale to the mentioned professor. Neither in the chair nor in the faculty, it appears, are they at all thinking of attracting from outside specialists who are capable of increasing the prestige of the school and ensuring the dynamism of its development.

The idea that we are creating a new society, working with the human material such as there is, is no longer new: all of us bear the mark of our day, past years and even ages and do not divide and cannot divide people into "pure" people and "unpure" people who are unworthy of admittance to the gates of paradise. I am personally inclined to forgive a person many sins, provided he has done his job. And has not feigned efficiency, has not run with documents, as often happens.

Borisov, may he forgive me, as a person is far from my personal ideal, but he knows, likes and does his job. And there is no better place than the faculty, where he could engaged in it. And therefore one can and should fight for him. If only, of course, not to suffer from such a disease as indifference.

Finally, is this not the main reason for the fading of some scientific schools--the increasing shortage of prominent individuals in the management of science, of leaders who, so to speak, are natural, "from God"? If this conjecture is correct, why does this phenomenon happen? Is it merely because we scientists are poorly reproducing and developing such potential leaders?

I have not named real names and have not cited the name of the higher educational institution, faculty and chair. In our scientific "shop," of course, many will easily understand, of which scientific subdivisions and people it is a question, but I would not want, in submitting the problem as a whole to the court of responsibility, to attract the attention to the reading audience at large to precisely this shop. It is no worse than the others, while the fate of scientific schools is an object of our common concern.

Afterword of the Science Department of LITERATURNAYA GAZETA. The problems raised in the article of Professor B. Khorev, in our opinion, are very urgent. Indeed, are they treating everywhere in scientific collectives with the proper attention such concepts as "scientific school," "creative atmosphere," "talented scientist" and "the individual in science"? Or, perhaps, have these concepts become hopelessly obsolete today, in the age of "mass science," when research is conducted by large collectives, when the organizational forms of science are in many ways reminiscent of the organizational forms of industry?

There is a separate question: Should prominent higher educational institutions at the same time be prominent scientific centers, as was the case in times past? Or is it possible to maintain a high level of the work instructors, without striving to achieve such a high level in research?

We would like to hear your opinion, comrades, on all this.

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GENERAL

LABOR INTENSIVENESS CONTROL CAN ACCELERATE S&T PROGRESS

Moscow SOTSIALISTICHESKIY TRUD in Russian No 2, Feb 85 pp 5-14

[Article by B. Avrov, chief of the Main Administration for Economic Planning of the Ministry of the Radio Industry, and L. Popov, chief of department in USSR State Committee for Labor and Social Problems]

[Text] The Ministry of the Radio Industry is working very hard to follow the guidelines of the December (1983) Plenum of the CPSU Central Committee, which has made an appeal to restore the movement for speedy achievement of planned labor-intensiveness. The work done by this sector was examined and approved by the USSR Goskomtrud [State Committee for Labor and Social Problems], which recomminded that its example be followed on a broad scale. The essence of the system being followed is described in the following articles.

Planned Labor-Intensiveness is the Way to Implement the Advances of Science and Technology

In a speech at a meeting of the Politburo of the CPSU Central Committee, pertaining to a draft of the plan for the 12th Five-Year Plan, K. U. Chernenko, general secretary of the CPSU Central Committee and chairman of the Presidium of the USSR Supreme Soviet, stressed that "it is planned to obtain almost the entire increase of the national income and 95 percent of the increase in industrial output through productivity. This means that our economy is advancing step by step to the stage where the entire increment in output of the national economy will be provided by increasing labor productivity." A concurrent task is being formulated to concentrate efforts on wise use of labor. In this regard, the instructions of the December (1983) Plenum of the CPSU Central Committee concerning the need to revive the movement for speedy achievement of planned labor-intensiveness on a new organizational and technical basis are gaining particular importance.

The nation's ever increasing need for products of the radio industry and consequent necessity of speedy development render this the problem of paramount importance to this sector. For this reason, the Ministry of the Radio Industry,

using the systems approach, developed and is implementing measures aimed at decreasing the labor-intensiveness of production. At the present time, to control labor-intensiveness in this industry, use is made of different concepts defining its forms according to composition of labor expenditures, as well as nature and purpose: entire planned labor-intensiveness, planned technological, actual, directive (according to plan), etc.

Total projected labor-intensiveness, which takes into consideration all industrial production personnel, reflects to the utmost extent socially necessary labor expenditure to produce goods. However, because there are no methods of estimating it, as well as other reasons, it is not used very much in industry as yet. Projected (technological) labor-intensiveness is used more broadly; it reflects standardized labor of the basic workers to put out a planned quantity of products with use of equipment, instrumentation, technological processes, forms of organization of production, labor and management as provided by the planned technology.

In view of the fact that utmost consideration must be given, in the course of developing the projected technology, to advances of scientific and technological progress, both in development of the design of products and determining how they are to be produced, projected labor-intensiveness emerges as a powerful factor for making use of these advances. This is why planned labor-intensiveness and its variants on all stages of product manufacture are the core of the system of control of labor-intensiveness of production that is used in the Ministry of the Radio Industry.

Work has been done a rather long time already on controlling labor-intensiveness of production. Since 1972, quotas for reducing labor-intensiveness were approved for each planned year as part of the sector's system for optimum organization and control of industry on the basis of economic-mathematical methods and computers. They were used to determine the labor-intensiveness of products and lower specific labor-intensiveness at the stage of preparing the advance draft of the plan. In 1966, instructions were introduced in the radio industry specifying two forms for the sector: "Assignment to lower labor-intensiveness of production at enterprises" and "Enterprise's report on performing assignment to lower labor-intensiveness of production."

The existing system had several serious flaws. There was no clearcut definition of a fixed base for keeping a record of labor-intensiveness, i.e., the level from which it was proposed to lower it. The estimates were based on data on actual labor-intensiveness of products, which carried the "load" of all technical and organizational flaws existing at an enterprise. Moreover, the methods of keeping records and making inspections required serious refinement.

There were no provisions for making it possible to compare labor-intensiveness of different types of products, including those that were related in design and technological characteristics. For example, it differed by more than 2 times for Sadko and Chayka television sets, adduced to the same composition. There were drastic differences in labor expenditures for production of tape recorders: labor-intensiveness for production of the Vesna tape recorder was 3.5 times greater than labor-intensiveness for analogous models at some enterprises.

The existing planning system did not provide for coordination of tasks to lower labor-intensiveness of production with the main plan indicators and, first of all, the planned level of labor productivity. The nature of records on reduction of labor-intensiveness did not permit determination of how this indicator affects labor productivity.

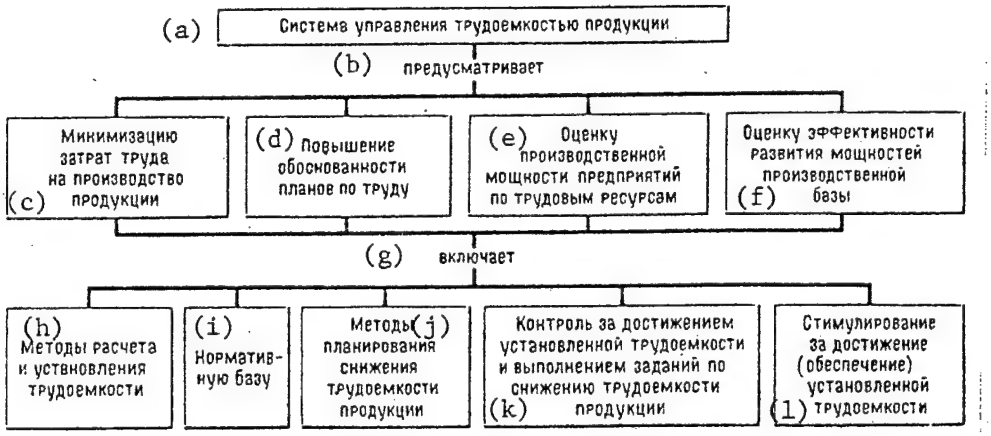
Experience in planning to lower labor-intensiveness made it possible to name the most important problems that the control system must solve with consideration of the specific distinctions of the sector. It is known that the radio industry is characterized by rapid replacement of products, which is related to the rapid pace of scientific and technological progress in radio electronics, where the annual volume of production in the first and second years of manufacture constitutes more than 25 percent of the total volume of production. For this reason, it was necessary to optimize labor-intensiveness of products starting at the stages of development and manufacture of the first batches (units) and to reduce the time of assimilating new production, making broad use of standard technological processes.

The products put out by the sector as a whole and by individual enterprises are notable for their complexity and constitute multifunctional systems and complexes with a large number of electronic and mechanical assemblies serving different purposes and with different possibilities of varying designs; the level of series production is low for most elements of the plan. All this raised the problem of developing a multilevel organizational system that would be capable of processing a significant amount of technical and economic information in a very short time.

The system for control of labor-intensiveness of production provides for regulation at all stages of the "development-production" cycle. During the period of transmittal of design documentation, determination is made of the projected technological labor-intensiveness of the product, which characterizes the labor expenditures of basic workers. In estimating it, one takes into consideration the attained level of technological producibility of product parts, efficient use of mechanization and automation, progressive organization of production and labor. This indicator serves as a target for the manufacturing enterprise and must be reached within 2-3 years after the start of production (when it reaches the planned volume) and thereby should provide for output of the product in the specified quantity. There are plans to effect expert evaluation of projected technology in the very near future.

After reaching the planned labor-intensiveness, the directive technological labor-intensiveness is set for subsequent periods, with due consideration of the latest achievements of scientific and technological progress (which were not considered when estimating projected labor-intensiveness). It reflects the changing and constantly increasing specifications pertaining to organizational and technical conditions of product manufacture. It is also projected that the level of automation and mechanization of production processes will rise, labor organization will improve, etc.

In the radio industry, at the early planning stages, along with projected and directive labor-intensiveness determination is made of limit technological labor-intensiveness as an assignment for the chief enterprise that is the developer of the product. Limit labor-intensiveness is the maximum labor expenditure for manufacture of the product, which is obtained by using progressive technological designs systematically at all stages of development. On the basis of this figure, the chief enterprise reports to co-executor enterprises the limit labor-intensiveness for the components of the product that they develop, taking into consideration labor expenditures for manufacture of analogues, parameters of components and extent to which they are subdivided.



System for control of labor-intensiveness of products provides for reduction of labor expenditures to develop and manufacture products on the basis of achievements of scientific and technological progress

Key:
a) system for control of labor-intensiveness of production
b) provides for
c) minimization of labor expenditures to manufacture products
d) improved validity of plans dealing with labor
e) evaluation of production capacities of enterprises according to manpower resources
f) evaluation of efficiency of development of production base capacities
g) includes
h) methods of estimating and determining labor-intensiveness
i) standards base
j) methods of planning to lower labor-intensiveness of products
k) checks achievement of established labor-intensiveness and performance of assignments to lower labor-intensiveness of products
l) incentives to achieve (provide for) set labor-intensiveness

Development and introduction of the system for control of labor-intensiveness of products occurred in several stages, starting in 1979, on the basis of prepared standards- and methods-related documentation. In order to reduce the

time and achieve a drastic reduction of labor expenditure to put out products, at the first stage the directive labor-intensiveness was established for all products being manufactured as of 1 July 1979. The methodological materials prepared by the sector's Center for NOTiU [Scientific organization of labor and management] were used: Temporary statute on sectorial system of work to determine directive labor-intensiveness for products being manufactured; Temporary methods for determining directive labor-intensiveness of products being manufactured; Temporary standard statute on material incentives for workers of associations and enterprises for attaining directive labor-intensiveness of products.

When setting the directive labor-intensiveness of products being manufactured, considerable reserves were discovered for lowering it, and rather heavy but feasible assignments were established for enterprises with regard to this indicator. While the rate of this decline averaged 8-9% per year in 1975-1978, it constituted 10-13% in the subsequent period.

In 1980-1981, the second phase of introduction of the system was effected: determination was made of projected labor-intensiveness when products are transmitted for industrial production, in accordance with the temporary statute on procedure for estimating and setting it. This permits lowering expenditures for production manufacture starting with the first year of production and shortens the time required to assimilate manufacture of new goods. At the second stage, it was possible to lower labor-intensiveness of products in the first year of their manufacture, starting in 1981.

In 1981-1982, the third and final stage was started in this sector--implementation of the Statute on procedure for setting limit labor-intensiveness of products.

At the present time, the standard-setting base of the system is being refined. Standard indicators of labor-intensity of elements of products referable to different levels of assembling them are being prepared. The combination of these indicators and the method of modular planning makes it possible, already at the early stages of plan development, to assess the efficiency and economy of different technological design versions and their conformity to the level specified in the assignment with regard to various parameters and, first of all labor-intensiveness.

At the present time, the system of controlling labor-intensiveness of products has a standards base that makes it possible to set a validated and progressive level for this parameter, which meets modern requirements of production technology and labor organization. Standards have been set for labor-intensiveness of components of consumer radio electronic equipment (BREA), which are used as an integral standards base to estimate planned, directive and limit labor-intensiveness of BREA. This procedure for building a standards base makes it possible to determine the planned labor-intensiveness of any form or type of consumer radio electronic equipment of the same technological generation. The standards base is revised for the next generations, with due consideration of changes in technology and organization of production.

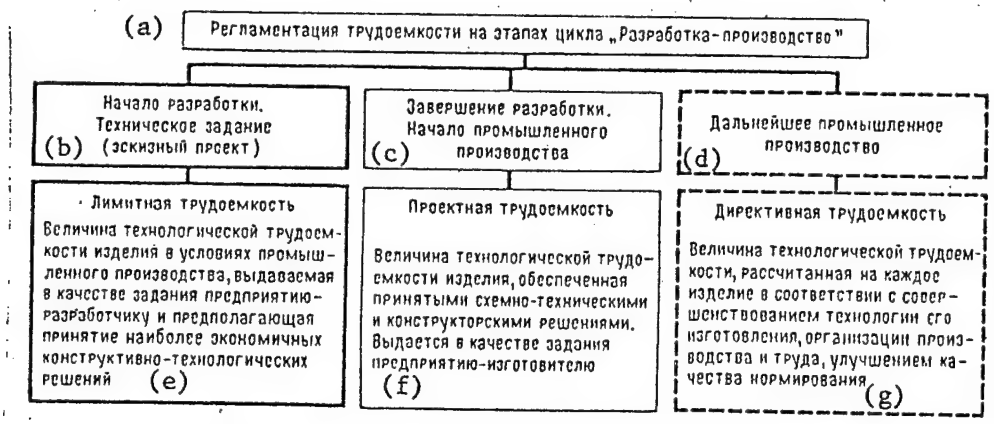
The levels of subdivision of products used in the radio industry provide for separation of radio electronic parts into systems, complexes and units. In turn, units are separated into 0, I, II and III-level modules constructed of standardized base carrier elements (UBNK). A projected technology is developed for each type of module and UBNK, work according to which is standardized according to the time standards in effect in the sector. The total standard time for production of parts, with consideration of their subsequent use, is the basis for estimating standards of labor-intensiveness of different modules and UBNK and, ultimately, for determination of projected labor-intensiveness of systems, complexes and devices.

Such an approach implies revision of the existing standards base for labor in this sector. It is necessary to develop enlarged standards for finished parts, units and assemblies. This also requires development of the brigade for of organization of labor. In order to have the labor standards come close to the socially necessary level of expenditure, at the present time the entire array of sector standards has been analyzed, and a plan was prepared for revising and amending them for 1985, and this will be done with the broad participation of enterprises. Special attention will be devoted to utmost introduction of intersector norms and standards.

Thus, the system for control of labor-intensiveness of products presently in effect in this sector consists of a set of statutes, methods and forms defining and regulating the methodology and organization of work to determine and achieve limit, projected and directive technological labor-intensiveness of a product at the stages of its development and production. The goal is to assure the minimum labor expenditure in manufacturing products on the basis of using the achievements of scientific and technological progress. The system provides for regulating the technological labor-intensiveness per unit product at all stages of the "development-production" cycle by means of establishing and constantly developing the standards base for estimates. It is planned to compare the capacity of the production base with respect to manpower resources and labor-intensiveness of the given production program on all levels of management (sector--subsector--enterprise--shop--brigade), as well as to determine the direction of development of the scientific-engineering and production base of the sector. It is then planned to expedite introduction and evaluation of the efficiency of new directions of scientific and technological progress (microminiaturization, new technological processes, retooling, etc.), assess the efficiency and select the routes for organizational development (introduction of collective forms of labor, improve quality of standard-setting, refinement of organization of work places on the basis of their certification and innovation). Changes will be made in methods of setting standards by means of development of labor standards for modules, base carrier elements, units, etc. There are plans to improve record-keeping and checking of performance of assignments to reduce labor-intensiveness of products and see that the established levels are reached, as well as for material incentives for lowering labor-intensiveness and bringing it to the planned level.

The work to refine the system for control of labor-intensiveness of products is being done in close connection with raising technological qualities of

product design, improvement of technical preparation for production and retooling of sector enterprises.



The basic principle for system operation is determination of given labor-intensiveness of each level for products by design organizations (limit labor-intensiveness) and manufacturer-enterprises for goods involving new equipment (projected labor-intensiveness) with target date to reach this level within 2-3 years; in the course of subsequent industrial production, the assignment is given to achieve directive labor-intensiveness

Key:

a) regulations on labor-intensiveness at different stages of "development-production" cycle
b) start of development; specifications (blueprint)
c) completion of development; start of industrial production
d) continued industrial production
e) limit labor-intensiveness: level of technological labor-intensiveness of product under conditions of industrial production given as an assignment to the developer enterprises, which implies making the most economical technological-design decisions
f) projected labor-intensiveness: level of technological labor-intensiveness of product provided by the adopted blueprint and design decisions; issued as an assignment to manufacturer-enterprise
g) directive labor-intensiveness: technological labor-intensiveness estimated for each product in accordance with improvement of technology of its manufacture, organization of production and labor, improvement of quality of standard-setting

For each stage of determination of labor-intensiveness forms of documents have been developed, in which its level is reflected and the procedure for approval is defined. Documentation regulating this level is prepared by the economic-planning, labor, design and technological services of developer-enterprises and manufacturer-enterprises, and it is part of the information that makes it possible to effect planning and other economic estimates.

On the level of the sector, responsibility for determining and expert evaluation of limit labor-intensiveness is placed upon the Main Technical

Administration (GTU). In each subsector, this duty is performed by the technical departments of the sector's main administrations. The enterprise that develops the product estimates the limit labor-intensiveness in accordance with the method adopted, coordinates and approves it. It must be noted that the enterprise that is the future manufacturer of the product participates in this, which makes it possible to assess the feasibility of filling out the order at the early planning stages, on the one hand, and validate future plans for development of enterprise capacity, on the other.

The Main Administration for Economic Planning (GPEU) is responsible for estimating and making expert evaluation of projected labor-intensiveness for all products transmitted to industrial production. Within the limits of the subsector, this work is headed by departments (groups) of labor or technical departments of the sector's main administrations (OGU), as well as estimating commissions that are formed either under the deputy minister or OGU. The product developer-enterprises estimate, coordinate and approve the projected labor-intensiveness.

The GPEU establishes the directive labor-intensiveness of products in the sector, whereas in the subsectors this is done by departments (groups) of labor and technical departments of the sector's main administration, as well as estimating commissions. The directive labor-intensiveness is estimated, coordinated and approved by the product-making enterprise, and the GPEU and technological administration of the sector are involved in coordination. Participation of the GPEU makes it possible to coordinate the product list, according to which the labor-intensiveness is regulated, with the production plan for the relevant period,and the level of labor-intensiveness and assignment to lower it, to the basic economic-technical indicators of enterprises and assignments dealing with growth of labor productivity.

The technological administration monitors evaluation of technological feasibility of products and defines the potential for raising the organizational-technical level of their manufacture as related to the potential capacities in the designs. It too settles the question of feasibility of increasing producibility of products.

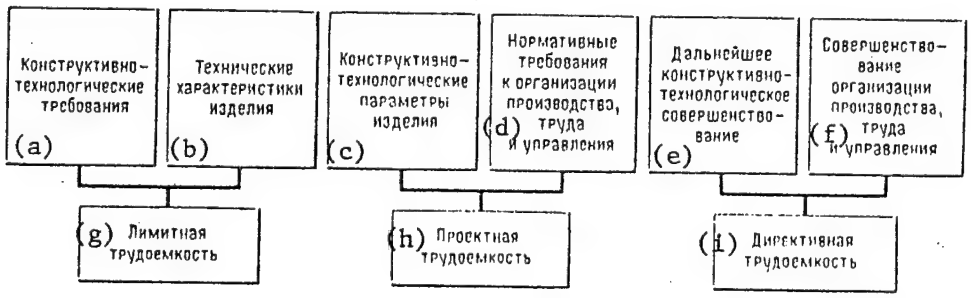
The Center for Scientific Organization of Labor and Management (NOTiU) is the chief scientific research organization for development and introduction of the system for control of labor-intensiveness of products in the sector; in the subsectors this applies to the technological and standards departments of chief scientific research institutes concerned with preparation of documentation pertaining to technological standards for control of labor-intensiveness of products, which are responsible for the system's operation.

Subsector departments develop and refine, in accordance with the methodological materials issued by the NOTiU Center, the standards for limit, projected and directive labor-intensiveness; they analyze all the necessary estimates and prepare them for approval. They examine discrepancies between developer-enterprises and manufacturer-enterprises with regard to limit and projected labor-intensiveness of products, and they prepare decisions on these matters. In addition, these departments coordinate work on evaluation of producibility of products and analyze its level; they check how assignments are performed

to lower labor expenditures and achieve directive labor-intensiveness; they analyze organization of work to lower labor-intensiveness of products at subsector enterprises; they develop and introduce labor standards. The active work of subsector departments of the head scientific research institutes permits prompt determination of tasks pertaining to level of labor expenditures for the entire diversity of products manufactured by the sector's enterprises.

Thus, there is fulfillment of the basic principle of the system for control of labor-intensiveness of products--interaction is provided between the main services--technological, planning and labor--on all levels of management in the area of lowering labor-intensiveness of products. Data on projected and directive labor-intensiveness of products serve as the basis for preparing plans for production and for labor in stages and at the times indicated in the system of optimum planning in effect in the sector.

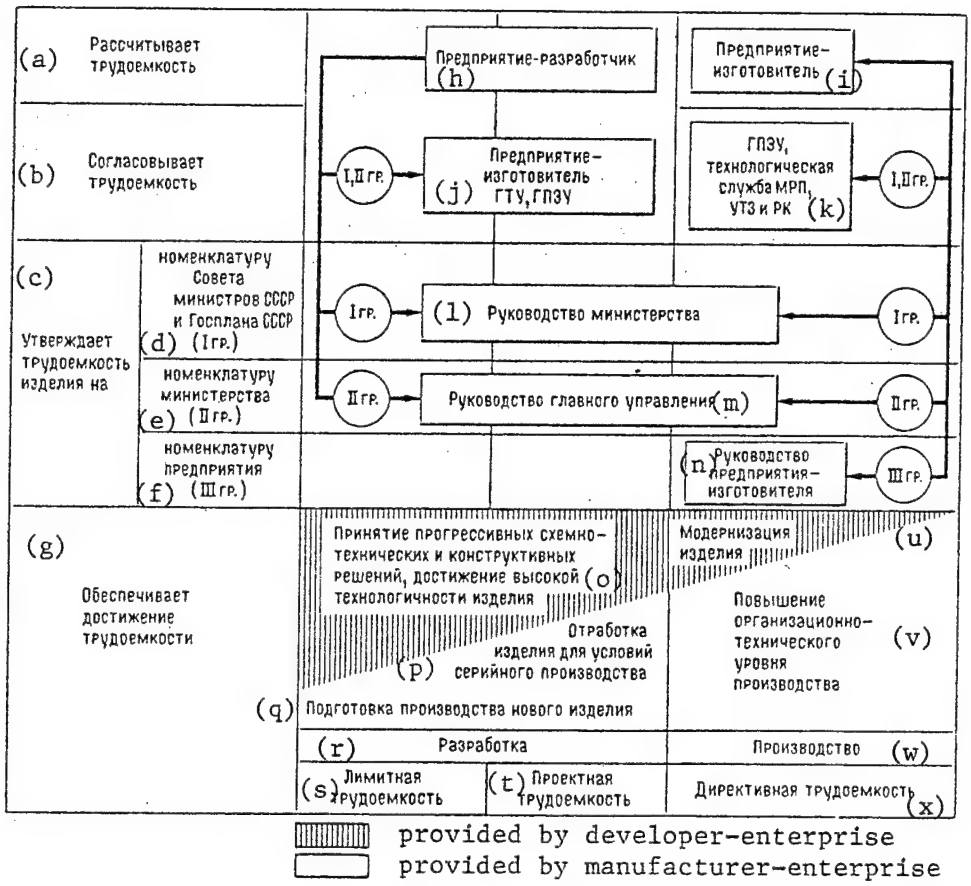
The modeling principle is applied in the sector's system for preparation of plans of economic and social development, and it is expressed in the form of multistage development of increasingly defined variants. Thus, the substantial distinction of planning in the radio industry is that a new stage has been added to the process of preparation of a plan--preparation of an advance draft of the plan--on the basis of control figures. This shortens the cycle of preparation of annual plans, permits evaluation of the level of capacity use and preparation of suggestions in order to eliminate weak points.



Formation of values for labor-intensiveness of products is based on design and technological parameters of products and factors characterizing the technical and organizational level

Key:

a) design-technological specifications
b) specifications of product
c) design-technological parameters of product
d) standard requirements of organization of production, labor and management
e) subsequent design-technological improvement
f) improvement of organization of production, labor and management
g) limit labor-intensiveness
h) projected labor-intensiveness
i) directive labor-intensiveness



Efficient operation of the system is obtained by the joint coordinated work of developer-organizations and manufacturer-enterprises at all stages of the "development-production" cycle

Key:

a) calculates labor-intensiveness
b) coordinates labor-intensiveness
c) approves labor-intensiveness of product for
d) product list of USSR Council of Ministers and USSR Gosplan (group I)
e) ministry's product list (group II)
f) enterprise's product list (group III)
g) provides for reaching labor-intensiveness
h) developer-enterprise
i) manufacturer-enterprise
j) GTU, GPEU of manufacturer-enterprise
k) GPEU, technological service of the radio industry ministry, UTZ [technical task administration] and RK [expansion unknown]
l) ministry management
m) main administration management
n) management of manufacturer-enterprise
o) progressive blueprint and design decisions, achievement of high producibility of item
p) refinement of product for series production
q) preparations for producing new item
r) development
s) limit labor-intensiveness
t) projected labor-intensiveness
u) updating product
v) raising organizational-technical production level
w) production
x) directive labor-intensiveness
гр.) group

At the intermediate stages of intrasector planning, the plan is optimized, the product list is defined and measures elaborated to eliminate any weak points. Special attention is given to analysis of enterprise capacity use with respect to manpower resources, which is extremely important when there is a shortage. At the final stage, in accordance with the production plan, projected and directive labor-intensiveness of products, the main administrations approve assignments for enterprises under their jurisdiction pertaining to growth of labor productivity, lowering labor-intensiveness of products and achieving the projected (directive) level. Concurrently, an estimate is made of available manpower on different levels of management (main administration--enterprise) on the basis of data on labor-intensiveness of the program. The plan is formed with use of computers, and use is made of the labor-intensiveness data bank, which was formed in the sector, pertaining to products under development and in production.

The system of control of labor-intensiveness of products provides for regulation of work to lower it at enterprises in the sector, where there is direct realization of planned indicators. The basic guidelines are defined in the sector's standard, "System of programmed planning and control of technological progress, scientific organization of labor and social development." Standards and other instructional documents are issued by enterprises, which specify the responsibility of different services for lowering labor-intensiveness; there are methodological statutes in effect, according to which the assignments to lower labor expenditure are distributed among the shops and services of the enterprises, and this provides for joint control and increases the responsibility of all enterprise subdivisions. Thus, the system organically integrates the work of the services and administrations of the ministry and all levels of production, from department to brigade and work place.

Certification and organizational planning of work places, checking and revising work norms, as well as material incentives for those who work on higher output norms, are an important element of the work that is being done. A system of automated planning of technological processes and norms (SAPR-TN) is being introduced at enterprises of the sector. It enables the technical services to plan technological processes and time norms, by concurrently assessing the efficiency of the approved decisions on the basis of design documentation, arrays of typical technological operations and time standards using computers operating in the dialogue mode.

The system for control of labor-intensiveness of products on all levels (enterprise--subsector--sector) functions by means of regulated control of lowering it and reaching the projected (directive) level. It is effected on the basis of enterprise records on fulfillment of assignments to lower labor-intensiveness of products and results of inspections.

Material incentives provide for efficiency of the system of revising norms and planned reduction of labor expenditures. Thus, at several enterprises, statutes dealing with awards establish the bonuses as a function of contribution of the personnel of a shop (department), section, brigade, engineering and technical personnel and workers to implementation of measures that permit lowering labor-intensiveness of products and reaching the projected level at the specified target date. For this purpose, it is planned to improve technology, organization

of production and labor, as well as promptly revise and replace obsolete norms with technically validated ones.

Labor-intensiveness of products can be lowered and its projected (directive) level can be reached only if the broad masses of workers are involved. Creative groups have been organized in the sector for mechanization and automation of labor and reduction of labor-intensiveness. As a result of introduction of mechanization and automation they develop, about 15 percent of the total decline of labor-intensiveness is obtained.

Introduction of the systen of control of labor-intensiveness of products in this sector made it possible to discover significant reserves for lowering it and, on this basis, to accelerate by 2-2.3 points the rate of reduction of labor expenditures to put out products under conditions of stable production. In 3 years of the 11th Five-Year Plan, labor-intensiveness of production of radio electronic equipment decreased by over 35 percent, which made it possible to obtain the entire increase in output (98 percent) of operating enterprises at the expense of increased labor productivity.

Analysis of labor expenditures for each item, which was made in accordance with the system, enables us to discover significant reserves for lowering labor-intensiveness. Thus, in 1985 there are plans to lower it for different types of consumer radio electronic equipment and computers five-eighths to two-fifths, as compared to 1983.

In order to achieve greater efficiency of operation of the system, already during the period of assimilating a product, extensive use is made in the sector of technically validated norms at the time new equipment is started up at the enterprise. This shortens the assimilation time and achievement of projected labor-intensiveness, and ultimately it increases the national economic effectiveness of the system.

The Ministry of the Radio Industry is continuing to upgrade the system of control of labor-intensiveness of production. In the very close future, there are plans to prepare the methods for comparative analysis of labor expenditure for manufacture of the same items put out by different enterprises in the sector, as well as to provide for regulations on labor-intensiveness for the entire list of manufactured products. There are plans to improve the standards base of the system making extensive use of the method of determining labor-intensiveness of different modules on the basis of the projected technology for manufacturing them, as well as to make broader use of computers to keep a record of actual labor-intensiveness of products and store it in data files. In store is the task of preparing and introducing a sector statute on material incentives for workers of scientific research institutes and design offices for establishing and reaching the limit labor-intensiveness of products.

Operation of the system of control of labor-intensiveness of products on the basis of regulating its level is the deciding factor that permits faster preparation for the output of new products and faster introduction of the achievements of scientific and technological progress to industry.

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GENERAL

HOW SCIENCE CAN HAVE A STRONGER IMPACT ON TECHNICAL PROGRESS

Minsk SOVETSKAYA BELORUSSIYA in Russian 22 Mar 85 p 2

[Interview with P. I. Yashcheritsyn by I. Mostkov under the rubric "Problems of Science": "Enthusiasm, Incentives and Rating Criteria"]

[Text] Means of further intensification of the influence of science on technical progress in the national economy was the topic of a conversation between our correspondent and P. I. Yashcheritsyn, academician-secretary of the Department of Physicotechnical Sciences, Belorussian Academy of Sciences]

[Question] The economic impact of introducing to the national economy of developments of institutes in your department exceeded 50 million rubles last year, which is an impressive sum. It is also indicative of the growth of science as an independent productive force of society and strengthening of ties between science and industry. But even this high result does not eliminate a number of problems of relations between scientific and industrial groups. For there are other indicators, which compel us to discuss these unsolved problems. In particular, the relatively low percent (slightly more than 30) of inventions that are used.

[Answer] It is no news that such problems exist. To some extent, I would say they are even valid: every stage of the scientific and technological revolution, every period of development of science and industry advance new requirements of both scientists and producers, as well as the relations between them. Some forms of relations are becoming obsolete and others are born. But their "birth" is not an easy process, and it does not take only 1 day. I think that expressly now, when both new guidelines for planning research and new forms of ties between scientific institutions and enterprises have proved their effectiveness, the question has arisen with particular acuity of changing from their common goals to common interest in the end results of scientific research. This includes use of inventions by enterprises. After all, their introduction does not merely upgrade products, but leads to retooling and radical changes in technology.

[Question] But is not this the goal of scientific research?

[Answer] So is production. So that the goals are the same, but interest is not always equal. Each innovation that revolutionizes production brings to scientists a certain economic incentive and even greater moral satisfaction. But for enterprise management, use of inventions sometimes involves considerable difficulties and risk. Yet there is not much reliable incentive for such risk, or sufficient personal interest in it on the part of producers. It is much more relaxing to wait until someone at another enterprise introduces the scientists' proposal and then take over their knowhow. But the same thoughts can occur at another enterprise. Sometimes, years go by in vain.

We are well aware of the fact that the conditions exist in worker groups for broad development of initiative. Here is an example. At the present time contractual prices are set in a number of instances for new consumer goods. This is a great incentive for development of a given type of production. It is felt that somewhere following a similar route incentives can be found that would accelerate introduction of new developments or, for example, use of inventions. I think that, ideally, one should strive to have enterprises, and primarily their management and engineering-technical personnel, be deeply interested in innovations; moreover, they should be interested in being the first to adopt some new equipment or technology. I wish, however, to repeat that practical workers are not involved in the "science race" as yet, and it is not backed up by the necessary incentives. Such innovations rely more on enthusiasm. It is all the more important to mention this since, in the very near future, it will generally be impossible to fulfill a production plan without use of the latest scientific achievements. We cannot do without science when adopting waste-free (or minimal waste) as well energy-conserving technologies, flexible automated processes, lathes with digital program control, industrial robots and manipulators controlled by computers, microprocessors....

It should be stated that scientists too are faced with major tasks to strengthen ties between science and industry. Unfortunately, they are not always informed of the problems that designers, technologists, other specialists, as well as sector scientific research institutes, are working on. They are not necessarily informed about the parameters of currently produced items that are inferior to foreign analogues, or the target dates for solving different problems. There are not many joint discussions of pressing scientific-technical problems.

[Question] I recall that expressly when you, Petr Ivanovich, were head of the Belorussian Polytechnic Institute, the first UNPO--educational-scientific-production associations--in the republic and, I think, in the nation were formed there. One of their advantages is long-term collaboration of scientists and enterprise specialists in development of technical and technological problems to the extent of their introduction to industry.

[Answer] Yes, such long-term collaboration turned out to be very necessary and effective. It is not by chance that it gained wide use at other VUZ's and in the Academy of Sciences. In particular, the institutes of our department and the Department of Physicomathematical Sciences participate in scientific-production associations with automobile and tractor builders, with industrial enterprises of Gomel.

Special-purpose programmed planning, integrated plans and scientific-technical programs, which provide for coordinated development, in stages, and introduction of the most important projects, and which also gained wide use in the last decade, also play an exceptionally important role. It is expressly and largely due to these organizational steps that such a high return from science became possible, as we have already discussed. But an increase in personal interest of producers in using basic innovations and inventions will not only fail to hinder the operation of associations and programs, it will make them even more efficient I believe.

[Question] However, most forms of contacts between science and industry, although they do often involve development of basic projects, still are aimed essentially at applied investigations. Does research and theoretical work find itself in something of a bind? After all, it is the main task for academic science.

[Answer] No, in my opinion such an oversight has not occurred. Because without this, scientists, to put it simply, would have nothing to introduce. After all, all innovative projects and even collaboration with industry ensue from our basic research and rely on it.

[Question] I should like to return to the question of incentives, this time for scientific workers. Introductions are made on the basis of economic agreements. Their participants at VUZ's receive additional remuneration, and in the academy, an award. But the authors of theoretical research and of all the projects on the state budget are not infrequently overlooked. Yet material incentives for such projects could certainly also become a reliable lever to increase the effectiveness of science.

[Answer] Some work is being done in this direction. For example, there are contests for ideas, other contests and reviews in the academy, the winners of which are encouraged with both spiritual and material incentives. But, I agree, these steps are merely an indication of a need to have incentives for theoretical research and introduction. One must look for the means of intensifying such incentives. In particular, enterprise administrators have the right to give awards for introduction of innovations not only to the immediate participants of an economic agreement, but the scientists whose theoretical research made it possible to solve applied problems. It is true that they have the right, but as a rule prizes are a rare exception. Yet they should become the rule. Enterprise management do not even make use of the leverage of moral incentives for scientists who developed and introduced innovation. Yet the testimonials, orders of appreciation and other forms of incentives, rare alas, are so important, boost morale and add creative strength.

I am not taking it upon myself to make a judgement as to the percentage of the obtained economic effect that scientists could expect as reward, under what conditions and procedures. These matters should apparently be resolved by economists. But I am for a clearer statute concerning moral and material incentives for scientists, both theoreticians and those who work on applied projects, as well as scientific teams as a whole. I am convinced that this

would create better conditions for intensification and improvement of basic research. The desirability of such steps is not in contradiction to the existing and justified, in my opinion, proportion of theoretical (budgeted) and applied (by economic agreement) work (about 48-50 percent of the former, 50-52 percent of the latter). But it is not in contradiction often merely because such a proportion is maintained by plan. Why conceal the problem: some scientists would rather reprint their former developments than investigate new ideas. In this regard, I should like to stress that without the constant generation of new ideas, without a solid bank of such ideas, without working for the future, science may soon become impoverished. As for introduction, in order to improve the effectiveness of science, it is imperative for the results of major research to be introduced in accordance with a plan and on a large scale, for example, in an entire sector or even several sectors of the national economy.

[Question] Thus far we have been discussing incentives and conditions of scientific work. Yet these issues are directly related to another, equally complex problem in my opinion, that of evaluating the creativity of scientists. For whom should incentives be provided, for what and on the basis of which indicators? An individual who generates idea may find himself in worse position according to quantitative indicators that someone who uses these ideas. And they are used to the extent of an individual's talent, experience and conscientiousness. One could hardly make a judgment about a scientist solely on the basis of the economic effectiveness of his development, the number of pages in his publications or other similar data. This applies to both individuals and entire groups....

[Answer] This is a very complicated question. I shall not attempt to answer it, although I will voice my opinion. Of course, there are some criteria on this score, and they are quite objective. I refer, first of all, to prizes--Lenin, USSR and BSSR state prizes, government and others. There are also the victories in competitions and reviews. And dissertations. And participation in Union, republic, sector, academy programs, and in other extremely important projects. Nor can one dismiss the quantitative indicators. After all, it is a fact that if each ruble spent in scientific divisions of our department for research yields a significantly greater return than in prior years, about 6 rubles, it means that we have worked better than before.

But the problem of ratings does exist and has not been definitively solved. Creativity of scientists, often even of teams, occurs often in leaps, it is unstable: the period of accumulation of material, cases and ideas (sometimes months, sometimes years) evolves into inventions, discoveries and major innovations in some cases. In other cases, it results merely in reports, modest articles and papers and minor introductions.... This is one side of the problem. Another one is the difficulty of comparing the results of work done by different groups. However, competition between scientific subdivisions has compelled us to search for rating criteria. Coefficients of the significance of different types of scientific work have been elaborated. How accurate are they? It is very difficult to reply. I think that under such conditions expert evaluations could be very helpful. Only scientists with authority can

determine the value, the level of scientific research, the achievements of a scientist and group. Without such expert conclusions, quantitative indicators suffer from formalism.

[Question] This leads to another question, the competence, authority and simply objectivity of groups of experts.

[Answer] Of course, it is very important for the people to whom we entrust expert decisions to be of utmost objectivity and authority so that their ratings would be unquestionable. So that not a single scientific specialty would turn out to be, so to speak, secondary, so that there would be no minimization of applied work, not the slightest impingement of basic research. This is why I consider it of exceptional importance to search for increasingly precise and more modern indicators of scientific results. Perhaps someone has suggestions on this score, it would be very interesting and important to advance them, for example, in a newspaper. Incidentally, there could be different opinions and suggestions concerning other issues in our conversation. Their discussion would definitely be of considerable benefit.

> Well then, Petr Ivanovich, we shall take advantage of your suggestion and invite interested readers, primarily scientists and producers, to voice their opinion, not only on issues that we touched upon in our talk, but other problems of increasing the effectiveness of science.

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GENERAL

CANDIDATES FOR MEMBERS OF UKRAINIAN ACADEMY OF SCIENCES

Kiev PRAVDA UKRAINY in Russian 10 Mar 85 p 3

[Article: "From the Ukrainian SSR Academy of Sciences"]

[Text] The Ukrainian SSR Academy of Sciences, in conformity with Section 21 of its Charter, announces the names of the candidates for full members (academicians) of the Ukrainian SSR Academy of Sciences and corresponding members of the Ukrainian SSR Academy of Sciences, who were nominated on the basis of the notice in the newspapers RADYANS'KA UKRAYINA and PRAVDA UKRAINY of 19 January 1985 by the councils of scientific institutions and higher educational institutions, state and public organizations, full members and corresponding members of the academies of sciences:

Candidates for Full Members (Academicians) of the Ukrainian SSR Academy of Sciences

The Mathematics and Cybernetics Department

Berezanskiy, Yuriy Makarovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Danilyuk, Ivan Il'ich--corresponding member of the Ukrainian SSR Academy of Sciences.

Samoylenko, Anatoliy Mikhaylovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Sergiyenko, Ivan Vasil'yevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Skrypnik, Igor' Vladimirovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Sharkovskiy, Aleksandr Nikolayevich--corresponding member of the Ukrainian SSR Academy of Sciences.

The Mechanics Department

Kozhevnikov, Sergey Nikolayevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Lotarev, Vladimir Alekseyevich--corresponding Member of the Ukrainian SSR Academy of Sciences.

The Physics and Astronomy Department

Belyy, Mikhail Ul'yanovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Zelenskiy, Viktor Fedotovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Kaner, Emanuil Ayzikovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Kosevich, Arnol'd Markovich--doctor of physical mathematical sciences, professor.

Krivoglaz, Mikhail Aleksandrovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Nakhodkin, Nikolay Grigor'yevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Snitko, Oleg Vyacheslavovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Strutinskiy, Vilen Mitrofanovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Shpak, Marat Terent'yevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Yatskiv, Yaroslav Stepanovich--corresponding member of the Ukrainian SSR Academy of Sciences.

The Physical and Technical Problems of Materials Science Department

Aksenov, Aleksandr Fedotovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Baptizmanskiy, Vadim Ippolitovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Naydich, Yuriy Vladimirovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Novikov, Nikolay Vasil'yevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Taran-Zhovnir, Yuriy Nikolayevich--corresponding member of the Ukrainian SSR Academy of Sciences.

The Physical and Technical Problems of Power Engineering Department

Dolinskiy, Anatoliy Andreyevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Podgornyy, Anatoliy Nikolayevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Shidlovskiy, Anatoliy Korneyevich--corresponding member of the Ukrainian SSR Academy of Sciences.

The Chemistry and Chemical Technology Department

Volkov, Sergey Vasil'yevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Kukhar', Valeriy Pavlovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Pashchenko, Aleksandr Aleksandrovich--corresponding member of the Ukrainian SSR Academy of Sciences.

Pokhodenko, Vitaliy Dmitriyevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Chuyko, Aleksey Alekseyevich--corresponding member of the Ukrainian SSR Academy of Sciences.

The Biochemistry, Physiology and Theoretical Medicine Department

Matsuka, Gennadiy Kharlampiyevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Smirnov, Valeriy Beniaminovich--corresponding member of the Ukrainian SSR Academy of Sciences.

The History, Philosophy and Law Department

Kondufor, Yuriy Yur'yevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Kutsenko, Vladimir Il'ich--corresponding member of the Ukrainian SSR Academy of Sciences.

The Literature, Linguistics and Art Department

Mel'nichuk, Aleksandr Savvich--corresponding member of the Ukrainian SSR Academy of Sciences and the USSR Academy of Sciences.

Novichenko, Leonid Nikolayevich--corresponding member of the Ukrainian SSR Academy of Sciences.

Candidates for Corresponding Members of the Ukrainian SSR Academy of Sciences

The Mathematics and Cybernetics Department

Valeyev, Kim Galyamovich--doctor of physical mathematical sciences, professor.

Ivanov, Viktor Vladimirovich--doctor of physical mathematical sciences, professor.

Kuz'min, Ivan Vasil'yevich--doctor of technical sciences, professor.

Letichevskiy, Aleksandr Adol'fovich--doctor of physical mathematical sciences, professor.

Litvinchuk, Georgiy Semenovich--doctor of physical mathematical sciences, professor.

Lukovskiy, Ivan Aleksandrovich--doctor of physical mathematical sciences, professor.

Makarov, Vladimir Leonidovich--doctor of physical mathematical sciences, professor.

Martynyuk, Anatoliy Andreyevich--doctor of physical mathematical sciences.

Molchanov, Igor' Nikolayevich--doctor of physical mathematical sciences, professor.

Pastur, Leonid Andreyevich--doctor of physical mathematical sciences.

Petrina, Dmitriy Yakovlevich--doctor of physical mathematical sciences, professor.

Pshenichnyy, Boris Nikolayevich--doctor of physical mathematical sciences, professor.

Red'ko, Vladimir Nikiforovich--doctor of physical mathematical sciences, professor.

Fushchich, Vil'gel'm Il'ich--doctor of physical mathematical sciences, professor.

Yadrenko, Mikhail Iosifovich--doctor of physical mathematical sciences, professor.

The Mechanics Department

Aleksandrov, Mikhail Nikolayevich--doctor of technical sciences, professor.

Blokhin, Yevgeniy Petrovich--doctor of technical sciences, professor.

Burak, Yaroslav Iosifovich--doctor of physical mathematical sciences, professor.

Vanin, Georgiy Andreyevich--doctor of technical sciences, professor.

Vovk, Aleksey Onufriyevich--doctor of technical sciences, professor.

Vorob'yev, Yuriy Sergeyevich--doctor of technical sciences, professor.

Grinchenko, Viktor Timofeyevich--doctor of physical mathematical sciences, professor.

Yefremov, Ernest Ivanovich--doctor of technical sciences, professor.

Zorin, Andrey Nikitich--doctor of technical sciences, professor.

Isakhanov, Georgiy Vakhtangovich--doctor of technical sciences, professor.

Klepikov, Sergey Nikolayevich--doctor of technical sciences, professor.

Kozlov, Leonid Filippovich--doctor of technical sciences, professor.

Kubenko, Veniamin Dmitriyevich--doctor of physical mathematical sciences, professor.

Kuz'menko, Vasiliy Aleksandrovich--doctor of technical sciences, professor.

Matveyev, Valentin Vladimirovich--doctor of physical mathematical sciences, professor.

Nebesnov, Viktor Ivanovich--doctor of technical sciences, professor.

Pavlovskiy, Mikhail Antonovich--doctor of technical sciences, professor.

Popov, Gennadiy Yakovlevich--doctor of physical mathematical sciences, professor.

Prisnyakov, Vladimir Fedorovich--doctor of technical sciences, professor.

Selezov, Igor' Timofeyevich--doctor of physical mathematical sciences, professor.

Smetanin, Yuriy Alekseyevich--doctor of technical sciences, professor.

Tarapov, Ivan Yevgen'yevich--doctor of physical mathematical sciences, professor.

Tsurpal, Ivan Andreyevich--doctor of technical sciences, professor.

Shul'ga, Nikolay Aleksandrovich--doctor of physical mathematical sciences, professor.

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Gostev, Vladimir Ivanovich--doctor of technical sciences, professor.

Dmitriyev, Vitaliy Mikhaylovich--doctor of physical mathematical sciences, professor.

Zalyubovskiy, Il'ya Ivanovich--doctor of physical mathematical sciences, professor.

Zapesochnyy, Ivan Prokhorovich--doctor of physical mathematical sciences, professor.

Zvyagin, Anatoliy Illarionovich--doctor of physical mathematical sciences, professor.

Kovtun, Nikolay Moiseyevich--doctor of physical mathematical sciences, professor.

Kondratenko, Anatoliy Nikolayevich--doctor of physical mathematical sciences, professor.

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Kucherov, Ivan Yakovlevich--doctor of physical mathematical sciences, professor.

Litovchenko, Vladimir Grigor'yevich--doctor of physical mathematical sciences, professor.

Men', Anatoliy Vladimirovich--doctor of technical sciences, professor.

Ofengenden, Rafail Getselevich--doctor of technical sciences, professor.

Pan, Vladimir Mikhaylovich--doctor of physical mathematical sciences, professor.

Peskovatskiy, Stefan Anatol'yevich--doctor of physical mathematical sciences, professor.

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Stepanov, Konstantin Nikolayevich--doctor of physical mathematical sciences, professor.

Strikha, Vitaliy Illarionovich--doctor of physical mathematical sciences, professor.

Taran, Vitaliy Ivanovich--doctor of physical mathematical sciences, professor.

Tikhinskiy, Gennadiy Filippovich--doctor of physical mathematical sciences, professor.

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Yefimov, Vladimir Vasil'yevich--doctor of physical mathematical sciences, professor.

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Kalyuzhnyy, Vladimir Antonovich--doctor of geological mineralogical sciences, professor.

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Shapoval, Viktor Ivanovich--doctor of chemical sciences, professor.

The Biochemistry, Physiology and Experimental Medicine Department

Belous, Apollon Maksimovich--doctor of medical sciences, professor.

Yesipenko, Boris Yevtikhiyevich--doctor of biological sciences, professor.

Kryshtal', Oleg Aleksandrovich--doctor of biological sciences.

Kurskiy, Mikhail Dmitriyevich--doctor of biological sciences, professor.

Kucherenko, Nikolay Yevdokimovich--doctor of biological sciences, professor.

Mel'nichuk, Dmitriy Alekseyevich--doctor of biological sciences, professor.

Stoyanoviskiy, Stepan Vasil'yevich--doctor of biological sciences, professor.

The General Biology Department

Gleba, Yuriy Yur'yevich--doctor of biological sciences.

Dolin, Vladimir Gdalich--doctor of biological sciences, professor.

Morgun, Vladimir Vasil'yevich--doctor of biological sciences.

Shakhbazov, Valeriy Gayevich--doctor of biological sciences, professor.

The Economics Department

Bondar', Interna Kas'yanovna--doctor of economic sciences, professor.

Borshchevskiy, Petr Prokopovich--doctor of economic sciences, professor.

Mikhasyuk, Ivan Romanovich--doctor of economic sciences, professor.

Onishchenko, Aleksandr Moiseyevich--doctor of economic sciences, professor.

Shepa, Vasiliy Vasil'yevich--doctor of economic sciences.

The History, Philosophy and Law Department

Maslov, Vasiliy Filippovich--doctor of juridical sciences, professor.

Onishchenko, Aleksey Semonovich--doctor of philosophical sciences, professor.

Sokhan', Pavel Stepanovich--doctor of historical sciences, professor.

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GENERAL

GENERAL ASSEMBLY OF LITHUANIAN ACADEMY OF SCIENCES MEETS

Vilnius SOVETSKAYA LITVA in Russian 28 Feb 85 p 1

[Article: "Strengthen the Ties of Science and Practice"]

[Text] Vilnius, 27 February (EL'TA)--The session of the General Assembly of the Lithuanian SSR Academy of Sciences, which was held today, examined the work of scientists of the republic, which was performed in 1984, as well as the plans for this year.

Academy President Academician Yu. Pozhela opened the session. Academician K. Meshkauskas, chief scientific secretary of its presidium, delivered a report on the scientific and scientific organizational activity of the academy. Academician Secretary of the Physical, Technical and Mathematical Sciences Department V. Statulyavichyus, Academician Secretary of the Chemical, Technological and Biological Sciences Department V. Kontrimavichyus and Academician Secretary of the Social Sciences Department I. Matsyavichyus reported on the plans of scientific research for 1985.

It was noted that the scientists of the republic are devoting much attention to the most urgent problems of Soviet science, which were outlined by the 26th CPSU Congress and the 18th Lithuanian CP Congress and by the subsequent CPSU Central Committee plenums. The formulation of comprehensive programs was continued, the efforts of collectives of scientists and production collectives were aimed at their solution. Much was done in the area of the study of the most important problems of power engineering, production automation, electronics and the introduction of mathematical methods and computers in production and scientific research activity. Specialists of mathematics and cybernetics did last year important work in the area of control, the recognition of processes and statistical physics, as well as on the development of mathematical models of automated control systems in microelectronics, solid-state physics and vibration technology. The work of specialists of thermal physics on the determination of the laws of heat exchange in powerful power systems, including at nuclear electric power plants, is of great importance. New possibilities of the development of ultrafrequency generators and ultra high-speed transistors, which are intended for computer equipment, were determined at the Institute of Semiconductor Physics. The contribution of chemists of the republic is also considerable: the technologies developed by them are being used extensively in the machine

building industry both in our republic and throughout the country. The institutes of the biological type made great gains last year. More and more groups of scientists are engaging in the study of fundamental questions of the regulation of biological processes at the cellular and molecular level. During the implementation of the USSR Food Program effective regulators of the growth of plants and preparations against diseases of livestock were developed, work is being performed on the increase of the efficiency of reclaimed lands. The institutes of the social sciences solved problems of the increase of the efficiency of social production, the improvement of management and forecasting and the interaction of mature socialist society and the individual. The number of scientific works on history, literature and linguistics increased.

The institutes of the Lithuanian Academy of Sciences are constantly strengthening the ties with scientific and production organizations, various forms of the integration of science and production have been tested here. Thus, using the cooperation of specialists of various scientific and technical fields and experimental bases, the Elektronika Scientific Production Complex is working on the problems, which are urgent for many national economic sectors, of the increase of efficiency and labor productivity and the improvement of the quality of items. The overall cooperation of institutes of the academy and the city of Shyaulyay is yielding a considerable impact. The technologies of electroplatings, which were developed at the institutes of chemistry and chemical technology, last year were used at more than 800 machine building enterprises of the country. The experience of the republic Academy of Sciences in the introduction of the results of scientific research recently received a positive rating at the meeting of the Collegium of the USSR State Committee for Science and Technology.

At the same time the scientists, who spoke at the session, stressed that it is necessary henceforth to increase the creative level of scientific research, to focus attention on the most urgent problems and to coordinate them more closely with the tasks of the development of the socialist economy and society. The development of the economic sciences should be radically improved, the contribution of scientific organizations to the implementation of the Food and Reclamation Programs should be increased. Scientists should contribute to the accomplishment of the subsequent tasks of the building of mature socialism by even more profound theoretical works. The preparation of scientific collectives for a worthy greeting of the 40th anniversary of the Great Victory, the 45th anniversary of the establishment of Soviet power in Lithuania and the coming 27th CPSU Congress was discussed in detail at the session.

At the session of the General Assembly V. Statulyavichyus was elected vice president of the Lithuanian SSR Academy of Sciences. New directors of the institutes were approved: the Institute of Semiconductor Physics--A. Shileyka, the Institute of Economics--E. Vilkas, the Institute of Philosophy, Sociology and Law--V. Lazutka, the Institute of Lithuanian Language and Literature--I. Lankutis.

Secretary of the Lithuanian CP Central Committee L. Shepetis, Deputy Chairman of the Republic Council of Ministers A. Chesnavichus, Chief of the Science and

Education Institutions Department of the Lithuanian CP Central Committee V. Baltrunas, republic Minister of Higher and Secondary Specialized Education G. Zabulis and other officials attended the session.

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GENERAL

CONFERENCE ON ACHIEVEMENTS, DEVELOPMENT OF SURGERY

Moscow MEDITSINSKAYA GAZETA in Russian 11 Jan 85 p 3

[Article by M. Sakhnovskaya: "For the Progress of Surgery"]

[Text] The Certification Department for Specialties of the Medical Sciences of the USSR Higher Certification Commission, the All-Union Scientific Center of Surgery of the USSR Academy of Medical Sciences and the Scientific Council for Surgery attached to the Presidium of the USSR Academy of Medical Sciences held a conference of chairmen and secretaries of the specialized councils for the specialty "surgery."

The conference commenced with the report of Academician B. V. Petrovskiy, director of the All-Union Scientific Center of Surgery of the USSR Academy of Medical Sciences, "The Achievements and Prospects of the Development of Soviet Surgery." Academician of the USSR Academy of Medical Sciences V. S. Savēl'yev, chairman of an expert council of the USSR Higher Certification Commission, delivered an analysis of the quality of the dissertation works on the specialty "surgery." The report of Professor Yu. Ye. Vyrenkov, chief of the Certification Department for Specialties of the Medical Sciences of the USSR Higher Certification Commission, was devoted to the improvement of the certification of scientists and science teachers and to the tasks of the specialized councils in light of the decisions of the June (1983) and April (1984) CPSU Central Committee plenums.

The state and prospects of the training of scientists in individual sections of surgery (Academician of the USSR Academy of Medical Sciences V. I. Burakovskiy, Corresponding Members of the USSR Academy of Medical Sciences B. D. Komarov and M. I. Perel'man, Academician of the Ukrainian SSR Academy of Sciences A. A. Shalimov) and the draft of the basic directions of the long-range plan of research of the Scientific Council for Surgery for the 12th Five-Year Plan (Professor V. I. Sokolov) were also discussed.

In the reports and statements and during the discussion it was noted that in recent years significant progress has been achieved in the development of surgery: the organizational bases and methodology of the treatment of widespread surgical diseases have been developed, new complicated types of

different reconstructive and restorative operations have been introduced in practice, new promising trends of clinical medicine, such as hyperbaric oxygenation, microsurgery, X-ray endovascular surgery, hemosorption and lymphosorption and others, have arisen and proven their effectiveness. This has found reflection in the materials of doctoral and candidate dissertations. The authors of several of them have been awarded USSR State Prizes.

At the same time the analysis of dissertation works also revealed a number of shortcomings, which concern their planning and scientific and procedural level. Thus, it is impossible recognize as justified that less than one-fifth of all the defended dissertations are devoted to the vast scientific theme, which is united by the state program "Develop and Introduce in Clinical Practice New Methods and Improve the Existing Methods of Reconstructive and Restorative Surgery, the Transplanting and Change of the Function of Organs." And first of all this concerns outlying institutions.

There are too few works on the prevention of surgical diseases, the identification of early forms of surgical pathology, the study of the effectiveness of surgical interventions and experimental surgery. The large number of dissertations, which are devoted to individual, special questions, the detailing and modification of widespread methods in already well-developed sections of surgery, attracts attention. The need for the further increase of the proportion of dissertations, which are of the nature of fundamental basic research on general surgical problems, is obvious. The All-Union Scientific Center of Surgery of the USSR Academy of Medical Sciences, the head institutes and their affiliates should influence more actively the very sources of the origin of dissertation themes, as well as their experimental and clinical realization. This is one of the most important conditions of the increase of the quality of doctoral and candidate dissertations.

The aspiration to obtain priority results should be backed by the high quality patent examination of dissertation themes, as well as the maximum use in the work of new medical equipment: endoscopes, X-ray equipment like the electroretinogram, equipment for angiography, ultrasonic diagnostic and surgical equipment, microsurgical instruments, scanners, modern immunological and bacteriological laboratories. The question of strengthening the experimental base of the institutions, at which the training of scientists is carried out, and of the role of the experiment in the solution of the vital problems of health care is on the agenda.

The conference participants also spoke about the advisability of organizing doctoral studies for specialists from outlying scientific research institutes and higher educational institutions with the possibility of the systematic sending of dissertation writers in the process of their work to large scientific centers. It is not the first time that the question of reviving the system of the supervision of doctoral dissertations has been raised. The efficiency of this measure is supported by weighty arguments, the main one of which is the increase of the quality of dissertations and of the responsibility for the training of scientists of the highest skill.

The time has come to revise the network of specialized councils for the defense of doctoral dissertations. The existence of those of them, in which

in 5 years one or two dissertations are defended, is hardly justified. Obviously, for the more profitable work of the specialized councils it is necessary to organize them by large regions, such as Moscow, Leningrad, the RSFSR, the Ukraine and Moldavia, the republics of Transcaucasia, the Baltic republics, Belorussia and so on.

A seminar of the scientific secretaries of the specialized councils for surgery, at which the demands of the USSR Higher Certification Commission on the drawing up and registration of documents on dissertation works were examined, was held within the framework of the conference.

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GENERAL

LIST OF PAPERS SUBMITTED FOR ESTONIAN STATE PRIZES

Tallin SOVETSKAYA ESTONIYA in Russian 2 Apr 85 p 4

[Article by G. Turopok]

[Text] The Commission for Estonian State Prizes in the area of science, technology and industry reports that 33 papers were submitted to participate in the competition for 1985 Estonia state prizes. The commission decided to admit all of the submitted papers to the competition.

The commission calls upon administrators of scientific and scientific-technical societies, scientific institutions, enterprises, organizations and higher educational establishments to organize a discussion of these papers and teams of authors.

All replies, data for public discussion and comments should be sent to the commission before 10 May 1985 at the following address: 200100, Tallin, Lossi Place 1. Information can be obtained by telephone--606-781.

List of Papers Admitted to the Competition for Estonian State Prizes

I. SCIENCE, TECHNOLOGY AND INDUSTRY

1. "Investigations of Theory of Multilayer Optical Systems"--P. G. Kard (group leader), N. N. Kristofel', L. Kh. Sossi and V. G. Fedoseyev. Submitted by the Institute of Physics, Estonian Academy of Sciences.

2. "Development and Introduction of a New Method and Microprocessor Complex for Monitoring Quality of Concrete and Reinforced Concrete Constructions"--O. Yu. Sammal (group leader), V. I. Kits, R. A. Mikhkelson, Ya. A. Oyarand, A. A. Rul'kov, I. I. Sits and A. G. Vendelin. Submitted by the Estonian State Committee for Construction Affairs.

3. "Development of Hardware and Software for Microprocessor Control Systems"--T. A. Arulaane, R. Kh. Khaavel', Yu. I. Yaaksoo, E. I. Yurviste, A. E. Kaukver, V.A. Kempo, Yu. Yu. Lankots, K. O. Myartin, R. A. Paluoya, E. M. Tal'vis, T. A. Tynspoyeg and Yu. E.-M. Ummer. Submitted by the Institute of Cybernetics, Estonian Academy of Sciences.

4. "New Surfactants. Synthesis and Properties"--S. I. Fayngol'd (group leader), Ya. Kh. Yyyers, Kh. E. Kiyk, M. I. Korv, A. E. Kuusk, T. N. Lesment, N. A. Maspanov, G. G. Stepanova, R. M. Tomson and Kh. P. Urbel'. Submitted by the Institute of Chemistry, Estonian Academy of Sciences.

5. "Work Done for Extensive Introduction of Dump Tractor and Trailer Rigs"--P. E. Vel'bri (group leader), L. A. Kiviloo, V. M. Kozlov, A. A.-V. Kuusk, A. A. Limberg, A. A. Lyps, A. I. Ritson, I. I. Silayev, Ya.-P. Ya. Taklaya, L. L. Vakhi, A. Y. Veski and E. A. Vyayartnyu. Submitted by the Estonian Ministry of Motor Transport and Highways.

6. "Diagnosis and Surgical Management of Chronic Ischemic Heart Disease"--T.-A. A. Sulling (group leader), Ya. E. Ekha, T. Y. Kask, A. A. Kivik, T. O. Keebi, R. Kh. Lay, Y. A. Maaroos, V. Yu. Mel'der, R. V. Teesalu and M. Ya. Tiyvel'. Submitted by Tartu State University.

7. "Development and Introduction to Production of Biotechnology for Processing Whey Into a Protein and Vitamin Product to Improve Feed Balance"--V. P. Makarov (group leader), T. A. Adler, K. E. Ant'ye, G. S. Borisova, R. O. Vilu, A. A. Vunk, K. K. Vyayarsi, M. V. Zalashko, R. R. Kippar and T. E. Tammik. Submitted by the Estonian Agroindustrial Association.

8. "Development and Introduction of Automated System for Combined Analysis of Economic Achievements of Industrial Production on the Basis of Matrix Models"--U. I. Mereste (group leader), G. M. Abramson, V. V. Vensel', Kh. Ya. Kala, Kh. A. Luur, E. I. Luur, A. K. Root, M. I. Saarepera and V. I. Taal'. Submitted by the Tallin Polytechnical Institute and Estonian Ministry of Light Industry.

9. "Development and Introduction of BUA-3S Drilling Rig in Mines of the Estonslanets Production Assocation (1978-1984)"--E. A. Vakher, A. E. Graf, G. D. Gudkov, E. G. Kal'yuvee, Ye. I. Kiselev, V. S. Marshev, R. M. Petrov, K.-V. I. Rego, V. M. Sadovnikov, Yu. V. Tambet, A. V. Urosov and R. A. Chistyakov. Submitted by the Estonslanets Production Association and Estonian Affiliate of the Mining Institute imeni A. A. Skochinskiy.

10. "Introduction of Series Erection and Manufacture of 16-Story Residential Buildings"--P. R. Veygel', R. Yu. Didyk, A. M. Karasev, P. V. Koydo, Kh. Yu. Kruus, P. F. Kreutsberg, R. Kh. Pakosta, A. A. Pikhlak, P. A. Redchits, A. D. Sorokin and A. P. Feofanov. Submitted by the Estonian Ministry of Construction.

11. "Design and Introduction of a New System of Traffic Organization in Tallin for 1976-1984"--V. I. Khel'm, P. E. Khunt, T. A. Liyra, A. A. Maaring, T. A. Metsvakhi, I. O. Pikhlak, E. E.-Kh. Puskar, R. Kh. Saart, Kh.-K. R. Uusmyae and Ya. E. Valgemyae. Submitted by the Tallin Soviet Executive Committee and Tallin Polytechnical Institute.

12. "Development of Material and Technical Base for Rayon and City Printing Houses, and Change in City, Rayon and Combined Newspapers to Offset Printing"--L. N. Parashin (group leader), E.-A. K.-I. Khelemyae, O. A. Lugus, I. I. Mel'tsas, A. A. Merivets, A. A. Mutt, R. R. Myttus, E.-L. L. Nittim, E. F. Puksing, Y. K. Rute, S. F. Saat and U.-A. A. Sillayye. Submitted by the Estonian State Committee for Publishing Houses, Printing Plants and Book Trade.

13. "Development and Introduction of New, Highly Efficient Equipment to Prevent Pollution of Baltic Sea Basin by Petroleum Product Waste and Oil From Small Fishing Vessels of Estrybakkolkhozsoyuz [Estonian Union of State Fish Farms"--O. A. Avaste, A. A. Kirm, K. A. Kikas, M. Ya. Kaazik, A. P. Link, V. V. Agurayyuya, A. K. Loomyagi and R. K. Laur. Submitted by the Estonian Republic Union of State Fish Farms.

14. "Development, Organization of Series Production and Broad Introduction of Transport Equipment and Office Supplies for Work Places on Sewing Lines of Light Industry Enterprises, Including Combined Mechanization of Sangar Flow-Factory [?]"--K.-P. P. Annus, M. F. Kadushin, M. Yu. Kasela, A. A. Koolmeyster, I. F. Kyopere, F. P. Lindvere, M. E. Luksepp, T. I. Puchinskaya, R. R. Seyepter, L. P. Silland, I. D. Steynberg and K. O. Symermaa. Submitted by the Estonian Ministry of Light Industry.

15. "Chemistry of Flaws in A2B6 Semiconductors and Development of Opto-electronic Elements on Their Basis"--Kh. A. Aarna, M. E. Altosaar, V. E. Valdna, Yu. A. Varvas, T. R. Varema, M. I. Krunks, P.-E. L. Kukk, E. Ya. Mellikov, Y. V. Palmre, Ya. V. Khiyye, A. I. Epik and A. Ya. Erm. . Submitted by the Tallin Polytechnical Institute.

16. "Development of Highly Rust-Resistant Liquid Fuel Sprayers Made of Solid Alloy Powders Without Tungsten and Introduction to Series Production at the Il'marine Plant"--L. E. Val'dma (group leader), P. K. Kallas, Ya. P. Kyubarsepp, Yu. A. Kyuttis, Yu. Yu. Pirso, Kh. P. Rokhtla, Ya. M. Saarse and E. E. Khinno. Submitted by the Tallin Polytechnical Institute.

17. "Development, Organization of Series Production and Introduction to Industry and Environmental Protection of Electrochemical Oxygen Analyzers (1966-1984)"--L. A. Kirsme, R. V. Marvet, A. A. Mashirin, E. K. Parve, V. E. Past, O. O. Rakhuoya, I. Ya. Raudsepp, T. T. Tenno, I. Kh. Tynuri, R. Kh. Khommuk and T. Kh. Yaetma. Submitted by Tartu State University and the Tallin Polytechnical Institute.

18. "Innovative System of Broiler Meat Production in Estonian SSR"--L. V. Gavrilova, Kh. A. Kunberg, L. A. Laysaar, A. N. Lind [deceased], V. N. Lind, K. I. Olu, Kh. K. Palla, O. Ya. Siymon, A. A. Turp and K. A. Fuks. Submitted by the Estonian Agroindustrial Association.

19. "Development of Theoretical Bases and Specialized Digital Devices With Flexible Structure for High-Speed Processing of Signals in Complexes for Automation of Scientific Research"--A. P. Ariste, I. O. Arro, E. I. Germ, O. E. Kangur, M.-E. O. Niyman, U. A. Niynsalu, A. E. Ots, T. Yu. Sullakatko, Kh. A. Tammet and V. R. Kheynrikhsen. Submitted by the Tallin Polytechnical Institute and Institute of Cybernetics, Estonian Academy of Sciences.

20. "Development and Set-Up of Series Production of High-Power, High-Speed Semiconductor Instruments for Electrified Transport and General Purpose Converters"--V. V. Vasyutinskiy, V. V. Zumberov, O. D. Itkin, Z. D. Karuse, S. Yu. Kasemaa, V. L. Kuz'min, E. S. Rusanova, O. K. Toomla, T. A. Uverskaya, R. V. Khanstin and A. V. Khizhnyakov. Submitted by the Tallin Electrical

Engineering Plant imeni M. I. Kalinin Production Association, Estonian republic board of the NTO [scientific and technical society] of the Power and Electric Engineering Industry and Estonian republic board of the NTO of Radioengineering, Electronics and Communications imeni A. S. Popov.

21. "Development, Investigation and Introduction of Light-Weight Wood Sheaths of Coatings"--M. G. Vayk, V. R. Kul'bakh, A. I. Lavrov, T. R. Rattasepp, A. M. Suurna, V. A. Khyutsi, K. P. Yyger and E.-Ya. E. Yust. Submitted by the Tallin Polytechnical Institute and Estkolkhozstroy Republic Association.

22. "Set of Studies (Scientific and Practical) to Improve Efficiency of Fuel and Power Management in Estonian SSR (1975-1984)"--Kh. Z. Barabaner, L. E. Vayk, E. A. Kallikorm, M. M. Mytus, Kh. E. Pitsner, A. A. Pesur, A. N. Semenov and K. E. Yaanimyagi. Submitted by the Institute of Thermophysics and Electrophysics, Estonian Academy of Sciences.

23. "Development and Introduction of Progressive System of Pedigreed Cattle Breeding in Estonian SSR"--Kh. A. Idarand, N. A. Edesi, Yu. A. Kumar, E. O. Lokk, A. P. Luurmees, A. E. Meyer, I. Ya. Myuyrsepp, S. A. Pallon, O. R. Saveli, N.-Y. M. Til'k, E.Ya. Umbleya and E.-A. K. Val'dman. Submitted by the Estonian Agroindustrial Association.

24. "Flora of Estonian SSR (11 Volumes)," Tallin, Estonian State Publishing House, 1959-1962;"Valgus," 1966-1984--L.-M. R. Laasimer (group leader), K. Yu. Eykhval'd [deceased], M. K. Kask, V. V. Kuusk, G. K. Muuga, Kh.-E. A. Rebassoo, S. Ya. Tal'ts, A. Ya. Vaga [deceased], L. T. Vil'yasoo [deceased] and A. Ya. Yuksip. Submitted by the Institute of Zoology and Botany, Estonian Academy of Sciences.

25. "History of the Estonian Literary Language," Tartu State University, 1970; "Estonian Dialects and Literary Language," Tallin,"Valgus," 1984--A. Kh. Kask. Submitted by the Native Tongue Society, Estonian Academy of Sciences.

26. "History of Tartu University (in 3 Volumes)," Tallin, "Valgus," "Eesti Raamat," 1982--K. K. Siylivask (group leader), Y. Yu. Elango, L. K. Eringson, S. T. Isakov, V. V. Kalnin', A. V. Koop, A. K. Liym, Yu. T. Lumiste, K. A. Martinson, Kh. A. Palamets, U. V. Pal'm and Kh. A. Piyrimyae. Submitted by Tartu State University.

27. "Ancient History of Estonia," Tallin, "Eesti Raamat," 1982--L. Yu. Yaanits, S. K. Laul, V. A. Luygas and E. Yu. Tynisson. Submitted by the Institute of History, Estonian Academy of Sciences.

28. "Completion of Publication of K. Marx's 'Das Kapital' in Estonian," Tallin, "Eesti Raamat," 1979-1982--E. Kh. Orgmyae, P. A. Freydin, A. E. Kleynot [deceased], E. E. Kuuskyull', M. Kh. Lumi and R. R. Siirak. Submitted by the Estonian State Committee for Publishing Houses, Printing Plants and Book Trade.

29. "Electric Drives," Tallin, "Valgus," 1984--U. M. Agur and Yu. A. Laugis. Submitted by the Tallin Polytechnical Institute.

II. Outstanding Achievements in Socialist Competition

1. "Development of Luun'ya Sovkhoz Under the 11th Five-Year Plan"--I. Ya. Laurits, A. M. Asi, T. K. Ilison, F. K. Yukhanson, V. G. Kyulasepp, R. G. Lokko, M. E. Madissalu, V. A. Madisson, M. P. Tamm and Yu. A. Tensing. Submitted by the Estonian Ministry of the Fruit and Vegetable Industry.

2. "Achievement of Highest Ratings by Leading Industrial Workers in Socialist Competition as a Result of Assimilating New Equipment and Progressive Technology in Felling Trees"--V. E.-A. Vyaliste, I. Yu. Mokhnya, Yu. Yu. Mokhnya, Yu. I. Pavlyuk, L. Yu. Luyk, V. Ya. Siling and R. Myanniste. Submitted by the Estonian Ministry of the Timber and Wood Processing Industry.

3. "Work Done by the Crew of the V. Lebedev Motor Ship in All-Union Review of Savings Made in Raw Materials, Materiel and Fuel-Power Resources in 1984"--A. E. Viks, Ya. O. Lepalaan, V. A. Smetanin, L. L. Trofimov and S. T. Tuntuyev. Submitted by the Estonian Maritime Steamship Company and Estonian Republic Committee of the Maritime and River Fleet Workers' Trade Union.

4. "Organization of Brigade Work of Telegraph Operators in the Pyarnuskiy Rayon Communications Center"--A. V.-Y. Nayssoo, M. V. Kuura, I. R. Leevik, M. V. Peebu, O. T. Tomilova, Kh. A. Kaloshkina, A. Yu. Pyldma, I. Ya. Loyme, V. Kh. Saun, E. Ye. Zotova, A.-M. R. Lindmaa, S. A. Kholberg, L.-L. Yu. Pyarn and T. D. Tammearu. Submitted by the Estonian Ministry of Communications and Estonian Republic Committee of the Communications Workers' Trade Union.

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GENERAL

SPEEDIER PRACTICAL USE OF INNOVATIONS DISCUSSED

Moscow IZVESTIYA in Russian 21 Mar 85 p 2

[Article by Academician N. Borisevich, president of the Belorussian Academy of Sciences, Hero of Socialist Labor: "Ideas Should Become Deeds Sooner--Introduction is the Key Task"]

[Text] The mechanism of transforming a scientific idea into a concrete deed, i.e., the mechanism of introduction, is flawed at present, and by far from every scientific idea or technical development born within the walls of an academy institute can reach its tangible implementation. And many do so after they have become obsolete and lost their timeliness and value.

For this reason, the search for, development of a reliable and perfect mechanism of introduction of scientific developments that would be consistent with current requirements has become one of the most important objectives today for theoreticians and practical workers. I believe that it would be of some interest to IZVESTIYA readers to learn about the mechanism of introduction that exists in Belorussia.

In that republic, a Commission of the Presidium of the Council of Ministers for Questions of Scientific and Technological Progress has been established. It has examined all of the most important projects of academy institutions and VUZ's which, for various reasons, had not gained practical use before. The tasks of introducing them or submitting them to experimental production testing had been included in the national economy plan. To overcome interagency barriers, three republic-level scientific production associations were formed that are under the direct jurisdiction of the Council of Ministers. At the present time, a unified republic-level "Science to serve industry" system is being developed, which is based on proper planning and concentration of scientific-technical potential on solving key problems.

As far back as the period of the 9th Five-Year Plan, a cost-accounting experimental design base began to develop rapidly in our academy. Many institutes made contracts with enterprises. Laboratories under dual jurisdiction (academic institute and enterprise or ministry) were opened. Under the 10th Five-Year Plan the economic impact of direct introduction of developments of academy institutes constituted 334.5 million rubles, which is 3 times more than in the preceding 5-year period.

But it became apparent at that time that it was impossible to further improve the effectiveness of applied developments by expanding the experimental design base and increasing the size of economic contract work. As far back as 1978, the volume of economic agreements constituted over half the total financing of the republic's Academy of Sciences. Its further increase could have an adverse effect on basic research. For this reason, we began to turn from direct contracts with one or a group of related enterprises to agreements with ministries for introduction of scientific developments to the sectors. The Academy is making increasing use of special-target planning programs.

At present, our academy participates in 36 Union and 36 republic-level scientific-technical programs; it works according to integrated plans with nine Union and five republic ministries, as well as many major production associations in Belorussia. Academy and sector institutes, enterprises and associations participate in working on problems. The median economic effect of introducing applied research of the Belorussian Academy of Sciences in 1981-1984 was twice the level in the preceding 5 years.

Now a few words about the end result of these joint studies. Since Belorussia is a republic with highly developed machine-building, the Academy devotes special attention to development of basic and applied problems related to machine-building. For example, the Institute of Engineering Cybernetics together with other organizations developed program-information complexes and equipment for automating design in machine-building. An automated system for design of parts and assembly units is used in more than 20 enterprises and a system for automated design of electrical equipment is used at 40. As a result of the automated system at the Minsk and Volga automobile plants, it was possible to reduce substantially the time spent on assembly, processing and analysis of data when testing automobile designs.

These developments, like many other, analogous ones, were effected within the framework of a special-target integrated program coordinated by the USSR State Committee for Science and Technology. The end goal of several of the tasks in the program is for the institute to develop, within the current 5-year plan, an intersector system of automated technological design planning in the machine-building industry.

The Physicotechnical Institute of the Belorussian Academy of Sciences is conducting basic and applied research on progressive waste-free technologies for metal and alloy processing. One of its developments is the technology and automated complex for cross-wedge rolling of parts. There are 50 such complexes in operation at 25 enterprises in our country, and they reduce by 40 percent the outlay of metal and increase by 10 times labor productivity.

The Ministry of the Automobile Industry has decided to set up series production of the complexes for its own needs. A specialized plant will be built in Belorussia to produce parts by this technology for general machine-building.

I should also like to discuss a form of contact that began here between science and industry. Scientific production associations and a republic-level scientific-technological center for reinforcement technology were formed with

the participation of academy scientists on a volunteer basis. The Avtofiztekh Association (physical and engineering institutes of the Academy and enterprises of the Belavtomaz Production Association) is administered by a council of representatives of the Academy and the production association. The plant research center plays an active part in this association.

It would seem that a convenient form of alliance between science and economics and an effective tool for transforming scientific ideas into concrete technology or a technological line have been found. But they are effective only if there is mutual interest in the end result. What if there is none?

Let us consider a specific situation. Our academy collaborates with the Beloruskaliy Production Association. For 10 years we have been making plans for joint work, held visiting meetings of the presidium with general management and established a unified coordinating council. Sector institutes were asked to become involved in the jointly developed program. As a result, a few innovations were introduced.

But a number of developments have still failed to be put to use. For example, glass-like coatings to protect steel pipes against corrosion are still not being introduced, although they could save a large amount of metal. As far back as 1976, the technology was developed for producing granulated fertilizer that dissolves slowly and is made from waste--clay-salt sludge and potassium chloride cyclone dust. But there is still no installation.

This was also the fate of a technology developed by scientists for recovery of feed and industrial salt from halite waste.

What is the matter? Why is that that an enterprise acts, it would seem, to its own detriment? But therein is the problem, it is to the detriment of the state and not itself. The Beloruskaliy Association receives funds for the needed amount of metals and it is little concerned with making use of waste. Neither it nor the ministry are seriously responsible for failure to introduce the proposals of scientists. The institutes under the Academy of Sciences have also been paying less attention to salt and mineral problems.

This is actually the main answer to the question of why many extremely valuable developments that could save the state tens of millions of rubles have not found applications.

Or, let us take inventions. If new instruments, technology and machines are developed on the basis of inventions made with the participation of sector scientific research institutes there is hope that they will see the light of day sooner; they have interested customers.

But many inventions are still born at institutes of the Academy and VUZ's. That is where the greatest difficulties arise, because the discoveries and inventions generated there had "not been in the plans." What is to be done with them? Some have suggested that specialized innovative firms be formed. I do not think that one more intermediate link will solve the problem.

At present, the academies of sciences of Union republics are major scientific centers. They contain institutes, the research of which is making the deciding contribution to the solution of the most important intersector problems. But at the present time, the academic institutes do not have any possibility, in essence, to effectively influence acceleration of scientific and technological progress in their field.

Such institutes should be made the chief organizations in the nation to deal with the different major scientific-technical problems. Let me clarify my suggestion on an example. The Institute of Peat of our academy is the nation's only academic institution that specializes in the study and comprehensive utilization of this extremely important organic raw material.

At one time, peat was only a fuel, then it started to be used as fertilizer. In recent years, interest in peat has grown drastically as an extremely valuable raw material in our country and abroad. In Belorussia, industrial wax and special lubricants have been made out of peat for several years. One can recover dyes from peat for wood, as well as feed additives, biostimulators and other equally valuable products. For example, combined granulated fertilizers based on peat hold much promise.

In our country there is an enormous reserve of peat, about 200 billion tons. By the year 2000, peat will apparently become one of the main types of organic raw materials. Even now, by decision of the State Committee for Science and Technology, a scientific-technical program is being prepared for development of waste-free peat-processing technology.

If the Institute of Peat, Belorussian Academy of Sciences, were given certain rights and its experimental base were fortified, it could perform well all of the duties of a chief scientific research organization dealing with this intersector problem.

The Institute of Engineering Cybernetics of our academy, which we have already mentioned, could become the chief intersector organization in the nation in the area of research and development of technological-design systems of automation of planning.

It is known that one cannot produce a modern machine without high-grade metal, reliable automation equipment and components. Of course, at the price of major efforts some sector of industry could advance. But it would soon feel for itself the lag in other sectors. Scientific and technological progress must cover all elements of the economy without exception. The advantages of our socialistic planned economy, high level of development of productive forces, powerful scientific-technical potential and improvement of contact between science and industry make it possible to succeed in solving the problem of intensification of the economy. But one must also make use of this opportunity. For this, it is necessary to exert a serious effort, make different and greater demands of both organization and quality of labor on all levels where science and industry are united.

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GENERAL

INTRODUCTION OF INNOVATIONS TO INDUSTRY TERMED A KEY TASK

Vilnius SOVETSKAYA LITVA in Russian 3 Mar 85 p 2

[Article by A. Ramanauskas, chief engineer for introduction of scientific achievements to industry, Presidium of the Lithuanian Academy of Sciences]

[Text] All branches of Soviet science, no matter how far from one another they may be, are presently united by a common task, which is to a significant extent the key to solving many problems of the national economy--increase in scale of introducing into production all that is new and advanced, which is developed by scientists. Not only the idea, but its concrete implementation are required of them. And it is expressly in this area, as we know, that the situation is not so good. For this reason, the Politburo of the CPSU Central Committee has deemed it mandatory to examine at the next Plenum of the Central Committee questions of accelerating scientific-technological progress and improving its control on all levels of the economy.

Before this event that is so important to the life of scientific circles, it would be quite reasonable to discuss once more in detail and analyze what has already been achieved on the rocky road of introduction, to arm ourselves with the progressive knowhow accumulated by scientific teams. And it is equally reasonable to consider, for this purpose, a group that has advanced the most toward bringing scientific ideas to life and practice. The Institute of Chemistry and Chemical Technology of the Lithuanian Academy of Sciences (ICCT) is probably the most likely one to serve in this capacity. As a rule, special electroplating shops of metal-working enterprises are the main consumers of the results of its scientific research. At the present time, there are more than 5000 such shops. The different purposes of output of many industrial sectors constantly advance new and more difficult requirements of the properties of electroplating, whereas the constantly increasing volume of industrial output renders the problem of intensification and automation of processes of applying this electroplating of first and foremost importance.

As a result of purposeful work at the institute, 82 new technologies have been developed, 73 of which are original and have been granted author certificates. They have been introduced in 50 plants in all of the main industrial centers of our republic--Vilnius and Kaunas, Shyaulyay and Panevezhis, Klaypeda, Alitus, Kapsukas, Mazheykyay. The geography of their use on a national scale is also impressive: Volga, Moscow, Gorkiy and Kamsk motor vehicle plants, enterprises of other sectors and agencies totaling 830 plants in the nation.

Use of technologies developed by the institute is economically advantageous for industry: 1 ruble of research expenditure yields about 3-4 rubles of savings, plus savings of more than 4000 tons of nonferrous metal per year. The effect from introducing the institute's developments to the national economy could be considerably greater if the USSR Ministry of the Chemical Industry were to find it possible to augment substantially the output of chemicals needed by enterprises that plan to use new technology. However, at the present time such deliveries constitute only 10-40 percent of the required raw materials. Now this is a serious problem that must be solved within the next few five-year periods! The extent of introduction of the institute's developments depends significantly on this, but the institute is by no means able to aid in solving this problem. The only thing it can do is, as the nation's chief organization in the area of electrolytic metallurgy, determine the basic need for chemicals up to the year 2000.

How then is the institute able to succeed so well in solving problems of introducing innovations? In the first place, this is aided by the very organization of scientific research. New technology is considered definitively developed there only if it has been tested under industrial conditions and adopted in at least one enterprise. The institute's experimental production base, construction of which was completed under the 10th Five-Year Plan, provides the opportunities for this. The authors are also interested in speedy testing and introduction of their brainchild, so that their participation in the final stage of the work is very active.

What solution are scientists of the ICCT finding when new chemicals or compounds are needed for the new processes that they developed? To wait until they are produced at the request of the institute at one of the country's enterprises could take sometimes a year, or two, or more.... The solution is simple: production of needed agents is organized concurrently with development of the process, right there at the institute's experimental production base. As a result, the time of testing and introducing an innovation is shortened by many times.

The second rather important condition for shortening the interval between development of something new and passing it along to industry is to spread information about it to all possible consumers. For this purpose, the institute uses the most diverse forms of work. For example, an agreement has been signed with the Lithuanian Scientific Research Institute of Scientific and Technical Information and Technical-Economic Research to disseminate technical documents about new processes. Upon receipt of requests from enterprises this institute reproduces such documentation and mails it out to requesters. For the last few years, several thousand copies of technical documents have been mailed all over the country each year. The ICCT also publishes a catalogue of developed technologies and chemicals needed for the former processes, as well as information brochures about the different technologies.

The exhibit of this institute at the Exhibition of Achievements of the National Economy of the USSR is also information for interested parties. It is constantly updated with new developments. In the last 10 years, the ICCT has exhibited its innovations at 40 exhibitions, including 10 abroad. It is opportune to mention here that 7 gold, 27 silver and 90 bronze medals were received

at these exhibits. The institute has also been the recipient many times of the Eureka grand prize of the Lithuanian Republic Society of Inventors and Efficiency Experts.

Seminars for workers in its industry, which the institute offers regularly, are also instrumental in broad dissemination of new technologies. Such a seminar is held each year at the Exhibition of Achievements of the National Economy in Moscow. There are also periodic seminars for this republic's industrial workers, where the authors of the developments inform industrial specialists about their work in detail.

The opening of laboratories, together with industrial workers, also helps reach the main goal, i.e., rapid trial and introduction of new technologies. The ICCT has two such laboratories; the institute has been collaborating in this way with the Kaunas Radio Plant since 1979; the tasks of the second laboratory include adjustment of new technologies for use on flexible automated lines.

The availability to the institute of a base electroplating shop is also solving, to a large extent, the problem of introduction; it was opened at the Sverdlovsk Medical Products Plant by contract for collaboration. The shop's task is to disseminate new processes to enterprises in the region. The staff of the ICCT helps the specialists in Sverdlovsk introduce innovations to the base shop, then workers at other plants learn about its experience with them.

The institute's contracts with planning and design organizations also help accelerate practical use of developed technologies; they include new processes in construction and remodeling plans for electroplating shops.

Speaking about the problems of introduction of innovations to industry, we cannot fail to mention the unequal conditions, into which the existing financing system places academy and agency institutes. For example, a new technology is introduced to an enterprise, and it improves product quality considerably, and as a result the enterprise's income rises. Part of the profit is automatically transferred to the bonus fund of the agency or applied institute if it developed the technology. However, an academy institute does not enjoy a material gain in such a situation. This is hardly fair. It is felt that equalization of rights of institutes under different systems--academy and sector--is necessary, as are economic incentives for developers who introduce innovations to operating plants.

Applied investigations and links with industry usually develop at the ICCT, as in other academy institutes of this republic, on the basis of economic agreements. There, the work done by economic agreement equals in the sense of finances the expenses for projects on the budget. The experience gained for several years shows that such a proportion is quite acceptable for this type of investigations and is not detrimental to basic research.

Today, having reached a rather high percentage of introduced innovations and having found a means of shortening as much as possible the interval between idea and its realization, the scientists of the Institute of Chemistry and Chemical Technology are searching for a possibility of broadening this work even

more. Such opportunities can be offered, in particular, by the Gal'vanotekhnika [electrolytic] scientific-technical association, that there are plans to establish at the ICCT. Operating on a voluntary basis, it will have as its goal to improve the efficiency of electroplating at enterprises, find the most effective forms of scientific research and rapid introduction of its results to the national economy.

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